A webcomic of romance, sarcasm, math, and language

xkcd

RANDALL MUNROE

2012

xkcd

2012

a collection of 157 webcomics

from #998 to #1154

by Randall Munroe
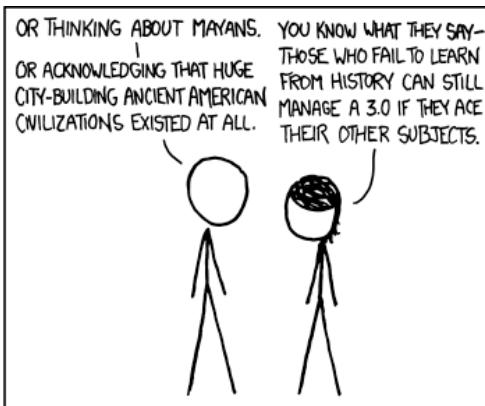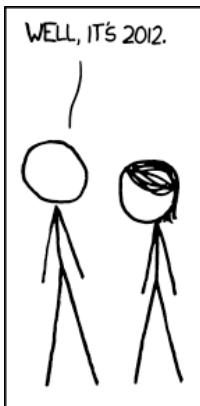
To compensate for this, I plan to spend **2013** doing nothing but talking about Mayans. My relationships with my friends and family may not fare well.

Explanation

This New Year comic is in reference to the fact that the Mayans, an ancient civilization in the Americas, created a calendar that ends (or, more accurately: restarts) on December 21, 2012. This date is regarded as the end-date of a 5,125-year-long cycle in the calendar used by the Mayan culture. Knowing this, some thought that the world was going to end on that date.

Consequently, a lot of people were talking about the Mayans, concerned that the world might end. After December 21, 2012 passed uneventfully, everyone was less concerned about the Mayans, because the world didn't end.[citation needed] It is worthy of note that this comic was published nearly a year before the "significant" date and that Randall predicted both the hype and the aftermath perfectly.

There is a measure of irony to be had in how the Mayans who still exist today were largely ignored by the doomsayers. "Or acknowledging that huge city-building ancient American civilizations existed at all."

In the final frame, Megan parodies the phrase, "Those who fail to learn from history are doomed to repeat it," applying a twist to suggest an academic context. In most American schools, a Grade Point Average is computed by assigning numeric value to each letter grade: A=4, B=3, C=2, D=1, and F=0; receiving high marks (all A's) thus yields a 4.0 GPA. However, if you "Fail to learn

from History" — that is, get a failing grade, F, and had at least 3 other classes (not an unusual course load) — you would still get a 3.0 with A's in those other classes. With a more common workload of eight courses per year, GPA as high as 3.5 can actually be reached in those circumstances. She is making the callous — if roundabout — observation that failing to grasp history, while no doubt troubling, isn't an academic show-stopper. Her comment may also be taken to suggest that people who feared the Mayan "prediction" of the end of the world would come to pass had failed to appropriately extrapolate from the numerous other faulty predictions of the end of the world. In fact the Mayans never actually predicted the end of the world with their calendar, they just didn't have infinite stone.[citation needed]

The title text jokes that to make up for the lack of Mayan discussion, Randall plans to spend 2013 talking solely about Mayans. For obvious reasons,[citation needed] people would probably get sick of this very quickly, hence his comment that his relationships might not fare well. Thankfully, as of 2014, not a single published xkcd comic of 2013 featured any Mayans, so we're pretty sure this promise wasn't kept.

#999: Cougars

January 04, 2012

WHOA, EVER SEEN WIKIPEDIA'S LIST OF PEOPLE WHO WERE ATTACKED AND KILLED BY COUGARS?

CRAZY HOW MANY OF THEM WERE KIDS WHO WERE JUST PLAYING OUTSIDE THEIR HOUSES.

REASON #58 I SHOULD NEVER HAVE CHILDREN: MY LOVE OF LEARNING AND SHARING KNOWLEDGE ABOUT THE WORLD.

If you're lying in bed tonight and you see yellow eyes glinting in your window, are you being stalked by a puma, a mountain lion, a panther, a catamount, or a cougar? Trick question--in North America, they're all names for the same species, Puma concolor! Isn't learning fun?

Anyway, sleep tight!

Explanation

Randall is giving reason number 58 why he should not have children. We see fictitious "father Cueball" talking about the Wikipedia entry for "List of fatal cougar attacks in North America". As stated, many of the victims were young children near their home.

If you tell a child about something dangerous, but without giving them necessary context to feel protected from it, you are likely to cause nightmares, sleeplessness, or other fear-related issues. In most, if not all, cases this would be considered bad parenting,[citation needed] hence a person who enjoys doing so should perhaps not have children.

The title text demonstrates that not only is Cueball sharing factual information, he is intentionally adding hypothetical detail (e.g. "yellow eyes glinting in your window") to make the danger seem even worse. The child is unlikely to agree that learning this is fun. Incidentally, a panther is not an actual species but rather a term for either leopards or jaguars with melanistic conditions. Mountain lions themselves are rarely called panthers.

#1000: 1000 Comics

January 06, 2012
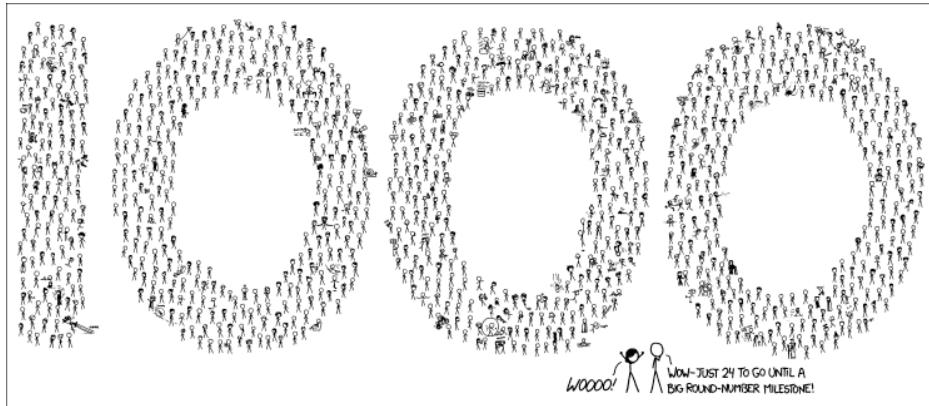
Thank you for making me feel less alone.

Explanation

This comic is the 1000th comic shown on xkcd containing 1000 characters from previous comics arranged in the shape of the number "1000". Megan is clearly excited as she screams "Woooo!", but Cueball, in true nerd fashion, thinks in base-2, saying that there are just 24 to go until a "big round-number milestone". The joke is that during programming, base-2 is used more often than base-10, making milestones powers of two rather than powers of 10. Where 1000 is a round number in base 10 (103), 1024 is a round number in base 2 (210). Binary is also referenced in the "Connect the Dots" puzzle, explained below.

In the 1000 comic Randall included 404: Not Found, see why in the explanation for this comic. This comic strengthens the fact that Randall did indeed count 404 as a "real" comic.

The 1000 characters[edit]

Each of the characters/drawings is numbered on this page:

• 1000: 1000 Comics/Numbered images

They are described on this page:

• 1000: 1000 Comics/1000 characters

Connect the Dots[edit]

There is a "Connect the Dots" puzzle hidden within the comic. However, rather than using the conventional decimal system

numbering which would start with 1 and count up, 2, 3, 4, 5, ... This "Connect the Dots" puzzle starts with 0 as a programmer would do and counts up in binary numerical order - 0,1,10,11,100,101,110,111,1000,1001 and back to 0. The revealed image forms the shape of a heart. This fits well with the title text where feeling less alone can equate to feeling loved.

#1001: AAAAAA

January 09, 2012

'ARE YOU TURNED ON YET?' 'I DON'T THINK SO--ARE YOU?'
'MAYBE A LITTLE!' 'OK, FIVE MORE MINUTES.'

Explanation

Megan and Cueball get the idea to build a rotating bed from a TV show like Cribs, which documents the decadent homes of the wealthy. The comic starts in medias res, leaving readers confused or concerned until the silly cause of the situation is revealed.

Rotating beds are typically used for sexual activity and variety, but Cueball and Megan have made theirs rotate far too fast, like a merry-go-round, to be useful for this purpose.

The last panel is a flashback to earlier that day, when they see a rotating bed on television. Megan comments that a rotating bed does not seem difficult to build.

The title text implies that the high speed of rotation is not accidental as we may have assumed from the comic, but intentional, due to Megan and Cueball's erroneous belief that the rotation itself is supposed to turn them on, not the sexual activity they would engage in on the moving bed. A turning bed is also a pun with "turned-on."

#1002: Game AIs

January 11, 2012
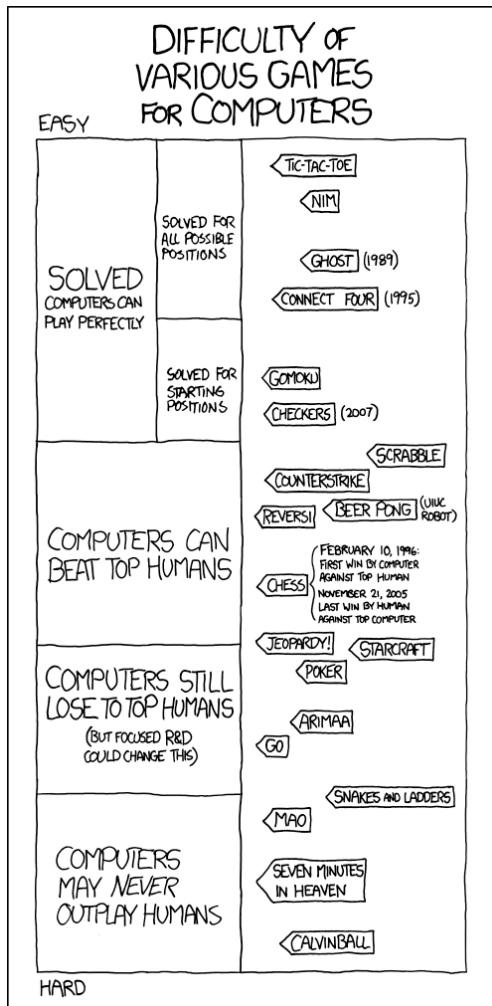
The top computer champion at Seven Minutes in Heaven is a Honda-built Realdoll, but to date it has been unable to outperform the human Seven Minutes in Heaven champion, Ken Jennings.

Explanation

To understand the comic, you have to understand what the games are, so let's go (but first, the years in parenthesis in the comic are the year that the game was mastered by a computer):

Solved[edit]

- Tic-tac-toe or Noughts and Crosses in most of the rest of the British Commonwealth countries is a pencil-and-paper game for two players, X and O, who take turns marking the spaces in a 3×3 grid. This game nearly always ends in a tie, regardless of whether humans or computers play it because the total number of positions is small. Randall posted a complete guide to the winning tactics more than a year before as 832: Tic-Tac-Toe.

- Nim is a mathematical game of strategy in which two players take turns removing objects from distinct heaps. On each turn, a player must remove at least one object, and may remove any number of objects provided they all come from the same heap.

- Ghost is a spoken word game in which players take turns adding letters to a growing word fragment. The loser is the first person who completes a valid word or who creates a fragment that cannot be the start of a word. Randall himself has written a perfect solution to Ghost, which he posted on his blog. Depending on the dictionary used, either the first player can always force a win, or the second player can.

- Connect Four (or Captain's Mistress, Four Up, Plot Four, Find Four, Fourplay, Four in a Row, Four in a Line) is a two-player game in which the players first choose a color and then take

turns dropping their colored discs from the top into a seven-column, six-row vertically-suspended grid. Randall made a reference of this game at 1767: US State Names.

- Gomoku (or Gobang, Five in a Row) is an abstract strategy board game. It is traditionally played with go pieces (black and white stones) on a go board (19x19 intersections); however, because once placed, pieces are not moved or removed from the board, Gomoku may also be played as a paper and pencil game. This game is known in several countries under different names.

- Checkers (in the United States, or draughts in the United Kingdom) is a group of strategy board games for two players which involve diagonal moves of uniform game pieces and mandatory captures by jumping over opponent pieces.

Computers Beat Humans[edit]

- Scrabble is a word game in which two to four players score points by forming words from individual lettered tiles on a gameboard marked with a 15-by-15 grid.

- CounterStrike most likely refers to the popular multiplayer shooter video game series about terrorists and counter-terrorists. Counter-Strike is notorious for the large variety of cheating tools that have been made for it; a computer would have essentially perfect accuracy and reflexes, essentially making it the aimbot from hell. It is theoretically possible for a skilled player to beat such an AI, but it would be extremely difficult to do so. Condition Zero has pre-set PvE scenarios called Deleted Scenes, but the AI used for enemies isn't particularly skilled and can be beaten by an average player.

- Beer pong (or Beirut) is a drinking game in which players throw a ping pong ball across a table with the intent of landing the ball

in a cup of beer on the other end.

- Reversi (marketed by Pressman under the trade name Othello) is a board game involving abstract strategy and played by two players on a board with 8 rows and 8 columns and a set of distinct pieces for each side. Pieces typically are disks with a light and a dark face, each face belonging to one player. The player's goal is to have a majority of their colored pieces showing at the end of the game, turning over as many of their opponent's pieces as possible.

- Chess is a two-player board game played on a chessboard, a square-checkered board with 64 squares arranged in an eight-by-eight grid. Each player begins the game with sixteen pieces: one king, one queen, two rooks, two knights, two bishops, and eight pawns, each of these types of pieces moving differently.

- Jeopardy! is an American quiz show featuring trivia in history, literature, the arts, pop culture, science, sports, geography, wordplay, and more. The show has a unique answer-and-question format in which contestants are presented with clues in the form of answers, and must phrase their responses in question form.

Humans Beat Computers[edit]

- StarCraft is a military real-time strategy video game series. The game revolves around three species, Terran (humans), Zerg, and Protoss, fighting for dominance in a distant part of the Milky Way galaxy known as the Koprulu Sector. Players must gather resources, build buildings and units, attack the opponent's base, and defend their base. While even average Starcraft players can defeat the AIs that originally shipped with the games, Starcraft has since been adopted as a standard benchmark for AI research,

largely because of its excellent balance. Thanks to that attention, computers can now defeat at least 99.8% of all players, and the trend does not look promising for humans.

- Poker is a family of card games involving betting and individualistic play whereby the winner is determined by the ranks and combinations of their cards, some of which remain hidden until the end of the game. It is also, however, a game of deception and intimidation, the ubiquitous "poker face" being considered the most important part of the game.

- Arimaa is a two-player abstract strategy board game that can be played using the same equipment as chess. Arimaa was designed to be more difficult for artificial intelligences to play than chess. Arimaa was invented by Omar Syed, an Indian American computer engineer trained in artificial intelligence. Syed was inspired by Garry Kasparov's defeat at the hands of the chess computer Deep Blue to design a new game which could be played with a standard chess set, would be difficult for computers to play well, but would have rules simple enough for his then four-year-old son Aamir to understand.

- Go is an ancient board game for two players that originated in China more than 2,000 years ago. The game is noted for being rich in strategy despite its relatively simple rules. The game is played by two players who alternately place black and white stones on the vacant intersections (called "points") of a grid of 19×19 lines (beginners often play on smaller 9×9 and 13×13 boards). The object of the game is to use one's stones to control a larger amount of territory of the board than the opponent. That computers would soon beat humans was the subject in 1263: Reassuring.

Update: on March 15, 2016, Google's AlphaGo beat Lee Sedol,

who was often seen as the dominant human player over the last decade, 4 games to 1 in a widely viewed match, and Computer Go was expected to become more dominant over time. In May 2017, Google's AI AlphaGo defeated the world's top human Go player. This was referenced three months later in 1875: Computers vs Humans.

Computers cannot compete[edit]

- Snakes and Ladders (or Chutes and Ladders) is an ancient Indian race game, where the moves are decided entirely by die rolls or other random number generators. (However, any person or computer choosing the numbers needed directly is called "cheating".) A number of tiles are connected by pictures of ladders and snakes (or chutes) which makes the game piece jump forward or backward, respectively. Since the game is decided by pure chance, it occupies the limbo where a computer will always be exactly as likely to win as a human (indeed, Randall's arrow points at the dividing line between 'humans beat computers' and 'computers cannot compete').

- Mao is a card game similar to Crazy Eights or Uno, with the twist that new players aren't told any of the rules and have to deduce them by trial and error. (The rules are sometimes summarized as "The only rule I can tell you is this one"). The goal of the game is to be the first player to get rid of all the cards in their hand, at which point that player invents a new rule and adds it to the ones already in the game. Computers would have a difficult time integrating into Mao as they would need a complicated learning engine capable of deducing rules with no prior training, and would also need the ability to be able to invent rules itself.

- Seven Minutes in Heaven is a teenagers' party game first recorded as being played in Cincinnati in the early 1950s. Two people are selected to go into a closet or other dark enclosed space and do whatever they like for seven minutes. Sexual activities are allowed; however kissing and making out are more common.

And finally

- Calvinball is a reference to the comic strip Calvin and Hobbes by Bill Watterson.

#1003: Adam and Eve

January 13, 2012
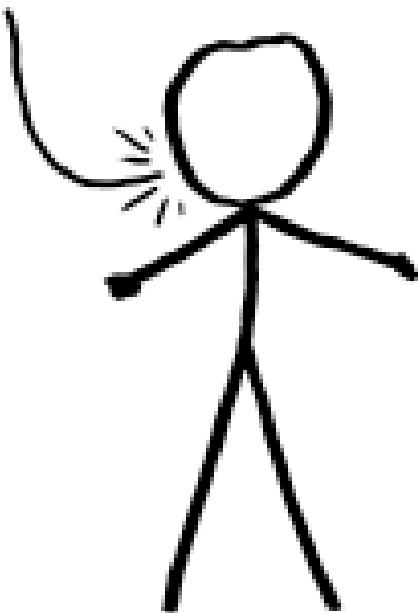
Abel and Steve would've been fine! I like Steve!

Explanation

This comic is a take on the anti-homosexual refrain, used often at those sorts of rallies "It was Adam and Eve, not Adam and Steve". This refrain is used to support the definition of marriage as between a man and a woman because in the Old Testament God created a man and a woman to start the human race. Adam and Eve are in the story in the Bible of the creation (Book of Genesis), and are the first pair of humans, created by God.

Adam walks in on Eve having sexual relations with Abel, who is Adam's son, which turns the joke from a homosexual one into an incest one.

In the title text, Adam continues that he would have preferred walking in on Abel and Steve. As well as probably no longer needing to be irked at the surprise involvement of his presumed spouse, and mother to his son, Adam seems not to have a homophobic prejudice (or less of one). Unlike those who use the contemporary version of the phrase. What's more, he doesn't personally dislike Steve in general and possibly considers him one of the better partners available at this time.
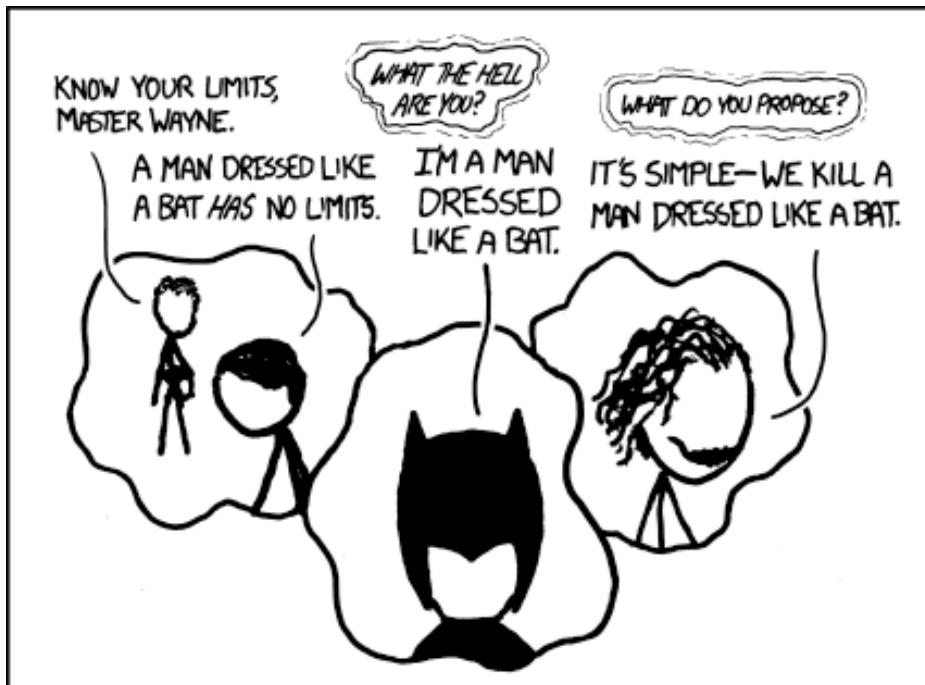
MY HOBBY:
WHENEVER ANYONE SAYS "BATMAN", I MENTALLY REPLACE IT WITH "A MAN DRESSED LIKE A BAT."

I'm really worried Christopher Nolan will kill a man dressed like a bat in his next movie. (The man will be dressed like a bat, I mean. Christopher Nolan won't be, probably.)

Explanation

This comic is a reference to the comic book and movie character Batman, who is actually wealthy playboy Bruce Wayne, as we see on the left being referenced as "Master Wayne" by his butler Alfred. Batman, in contrast to Superman and other comic book heroes, has no superpowers. The name "Batman" suggests that he is a man who is part-bat, or has bat-like powers, but his only actual connection to bats is that he wears a bat-themed costume -- hence the description, "a man dressed like a bat." Thus, when Batman's connection to bats is made explicit, he loses a lot of his mystique.

The stick figure representations of Batman and his nemesis, the Joker, are shown from three different movie scenes of the Dark Knight Trilogy, the most recent Batman films at the time of this comic. The middle scene comes from Batman Begins, whilst the two flanking scenes are from its sequel The Dark Knight. In each scene the name "Batman" is substituted with the accurate but embarrassing description "a man dressed like a bat." In this way, Randall is pointing out that Batman commands a lot of respect and fear considering that all he is is a man in a costume.

Then in the title text, Randall expresses his fear that Christopher Nolan (the director/producer/writer of the latest Batman trilogy) was going to kill Batman off in the then-upcoming movie Dark Knight Rises. Of course, Randall substitutes for "Batman" as in the comic. This

causes a grammatical ambiguity which Randall points out where the "dressed like a bat" could apply to the "man" or to Nolan. A similar ambiguity explicitly discussed in the title text of 1087: Cirith Ungol.

There have been several comics using substitutions, but this may have been the first.

#1005: SOPA

January 18, 2012
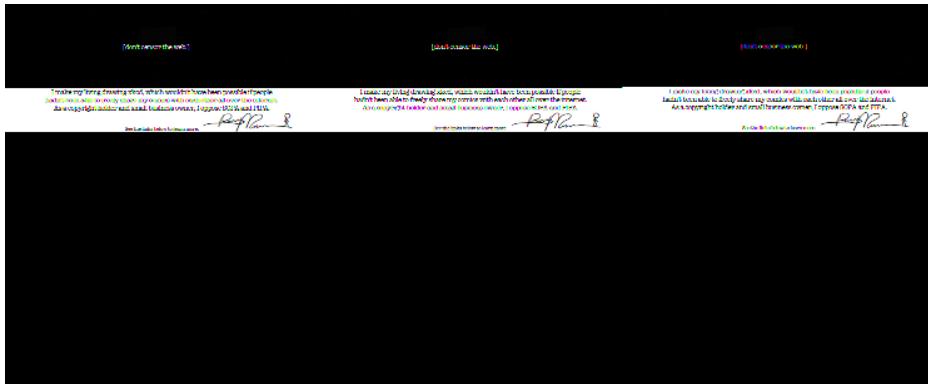
In protest of SOPA, I'm currently getting totally blacked out.

Explanation

SOPA, the Stop Online Piracy Act and PIPA, the Protect IP Act, were a pair of controversial bills being considered by the United States government in late 2011 and early 2012. The bills contained the ability for the US government to deny American internet users access to certain sites at a judge's request. These would be activated if the government could prove to a court that a site was primarily used to harbor illegally distributed copyrighted goods, such as video games, music, and TV shows.

Many people considered this to be censorship and were concerned that this could instead be used by larger corporations to squelch smaller competing sites who may not have the resources to challenge a "take-down notice" in court, should judges continually agree with the larger corporation.

As the bills gained infamy online, many popular websites and web comics participated in a mass protest on January 18, 2012, to announce their displeasure with the bill in an attempt to convince the House of Representatives to reverse their judgement, which had at the time been considered likely to pass if drafted.

This was xkcd's participation in the protest. Randall discusses below the black panel that if he was having better copyright protection with these new acts then he would never have gotten this popular since his fans

would not have been allowed to distribute the comic gaining him new followers.

In typical xkcd fashion, this comic contains several layers of depth that may not be immediately obvious to the casual observer. In this instance, the apparently solid-black region contains a hidden image revealed with simple brightness+contrast manipulation (or simply loading the image into Microsoft Paint and using the fill tool), with Black Hat saying "A message from sysadmins everywhere: Seriously, don't screw with DNS. If you break this internet, we are not making you a new one." This stems from the fact that sites could be ordered taken down by allowing manipulation of the DNS itself, effectively making a site completely disappear from the web. This court-enforced DNS manipulation was considered by many technical professionals to damage the underlying structure of the internet, as well as potentially criminalizing recent work to improve its security.

The title text referred to a common theme across protesting sites: a blackout of the internet. Sites such as Google changed to a black background, while Wikipedia prevented access by linking their sites to a black page with white text explaining their participation. On the day of the protest, xkcd was similarly "blacked out," with all comics redirecting to this one. The humor is that Randall has jokingly misinterpreted this "blackout" to mean that he should instead protest by "getting totally blacked out" – i.e. by drinking so much alcohol that he gets drunk, passes out, and wakes up the next day having no memory

of his actions or experiences during his drunkenness; despite Randall's good intentions, this would probably not help the protest against SOPA/PIPA.[citation needed]

After the protest, the bills were postponed from being drafted on January 20, 2012.

#1006: Sloppier Than Fiction

January 20, 2012

EVEN THOUGH IT TECHNICALLY *WASN'T* CHEATING, SHE DUMPED ME ANYWAY! SO I TELL BRET, AND HE'S LIKE, "SHE SOUNDS JUST LIKE *MY* CRAZY EX." AND I WAS LIKE, "DUDE WHAT WAS HER NAME?" AND IT WAS THE *SAME GIRL.*

I SWEAR, IF THEY MADE MY LIFE INTO A MOVIE, NO ONE WOULD BELIEVE IT.

YEAH, THOUGH MOSTLY BECAUSE OF THE POORLY-WRITTEN DIALOGUE AND UNLIKEABLE MAIN CHARACTER.

Roger Ebert once called you directionless and unwatchable.

Explanation

In this strip, Goatee Guy claims that "if they made my life into a movie, no one would believe it", suggesting that he thinks his experiences are so unlikely and interesting that they'd be considered too exaggerated for fiction.

Cueball agrees that no one would believe the movie, but claims that it's due to "the poorly written dialogue and unlikeable main character", turning the claim into a put-down of Goatee Guy. This response has two main aspects: that the events Goatee Guy is describing aren't especially well-told, and that Goatee Guy himself is personally unpleasant (in addition to not be especially articulate, or conveying a rambling anecdote as meaningful as he believes them to be).

From what little we hear of Goatee Guy's story, both of those assumptions seem to be justified. The crux of his story is that his ex-girlfriend had once dated an acquaintance of his, which is not a particularly uncommon or interesting event. Absent a more interesting twist (or at least some interesting storytelling), it constitutes a mild coincidence, not something particularly noteworthy, let along implausible.

And the little we know about Goatee Guy helps explain why Cueball finds him unlikeable. He did something that he claims "technically wasn't cheating", which implies that he was unfaithful, and tried to justify himself with a loophole. Then he went around telling the story

to others, apparently blaming his ex, rather than himself, and repeats Bret characterizing her as "crazy". All of these things make him sound boorish, rude, self-centered, and misogynistic.

The title is a play on the old saying that "truth is stranger than fiction." In this case, the title implies that Goatee Guy's story isn't stranger than fiction, but is a sloppy enough story that it wouldn't qualify as good fiction.

In the title text, Roger Ebert was a famous American movie critic, who could be quite caustic when reviewing a movie he disliked. "Directionless" and "unwatchable", along with Cueball's initial complaints of "poorly-written dialogue and unlikeable main character," are common criticisms of bad movies, but have entirely different and much more personally cutting connotations when applied to a human being.

#1007: Sustainable

January 23, 2012
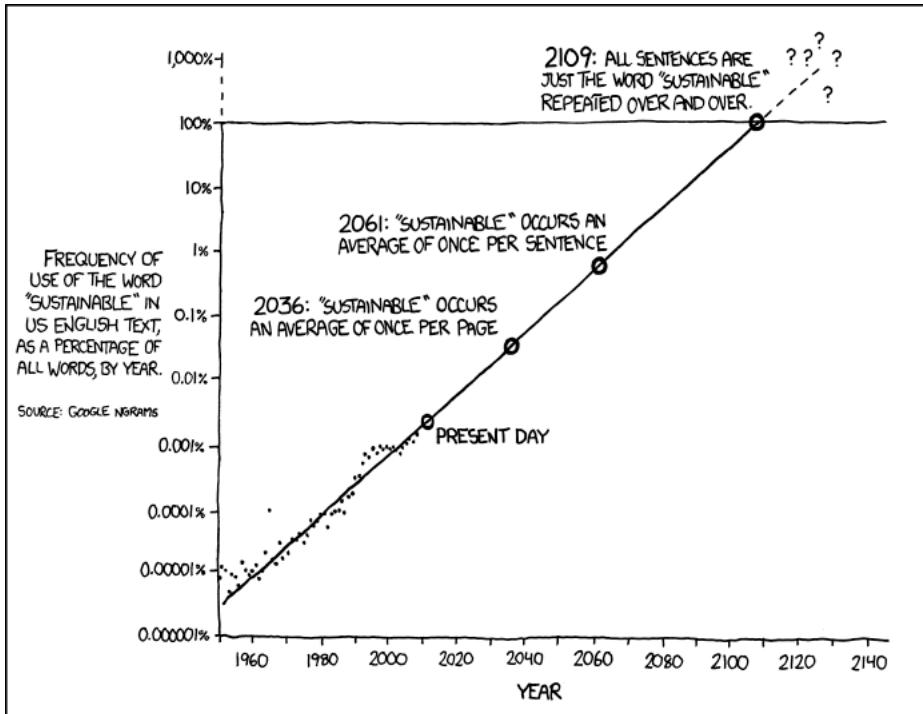
THE WORD "SUSTAINABLE" IS UNSUSTAINABLE.

Though 100 years is longer than a lot of our resources.

Explanation

This is a simple scatterplot showing how often the word "sustainable" has been used in English texts in the US each year. As can be seen, the y-axis is given a logarithmic scale, meaning that the apparently linear trend is actually exponential. Randall humorously attempts to extend the graph to the point the frequency exceeds 100% about a century from now, which is obviously impossible (hence the quip that the word's usage is itself "unsustainable").

The use of the word "sustainable" has been increasing as people become more aware of the steadily increasing use of nonrenewable resources and need to ensure that the Earth's resources do not become totally exhausted, through sustainable development. Sustainable development refers to the practice of using resources that simultaneously aims to meet human needs while preserving the environment so that these needs can be met not only in the present time, but also for generations to come.

More realistically, the actual use of "sustainable" is likely to be logistic rather than exponential growth. A logistic curve (not to be confused with "logarithmic") describes a trend that at first appears to behave exponentially, but then tapers off and reaches a cap, as it is actually a curve leading up to an arbitrary mid-point 'origin' part way through the track and then levels back off again (in a doubly-reflected manner, typically) to reach a new plateau. This is demonstrated by the Google ngrams

graph of word usage for "sustainable". Logistic growth is commonly used to model data that naturally increases exponentially but has a limiting factor, which in this case is the meaningfulness of text consisting entirely or mostly of a single word. Until we actually reach the logistic midpoint (possibly at 50% usage, but very much depending upon other confounding factors and likely somewhat less in this actual case) the data might indeed look like they fit a log-plotted exponential curve.

As Randall somewhat depressingly mentions in the title text, the ~100 years that it will supposedly take for the word "sustainable" to become unsustainable is actually a lot longer than most of our nonrenewable resources will last on the Earth. The idea that all of the Earth's coal, oil, natural gas, etc. that has built up over the past millions of years may be completely gone within the century is unsettling. This comic was used in the 2018 book Enlightenment Now: The Case for Reason, Science, Humanism, and Progress by Steven Pinker as it discusses the concept of sustainable energy.

Extrapolation and interpolation, often absurd, are recurrent topics on xkcd.

#1008: Suckville

January 25, 2012
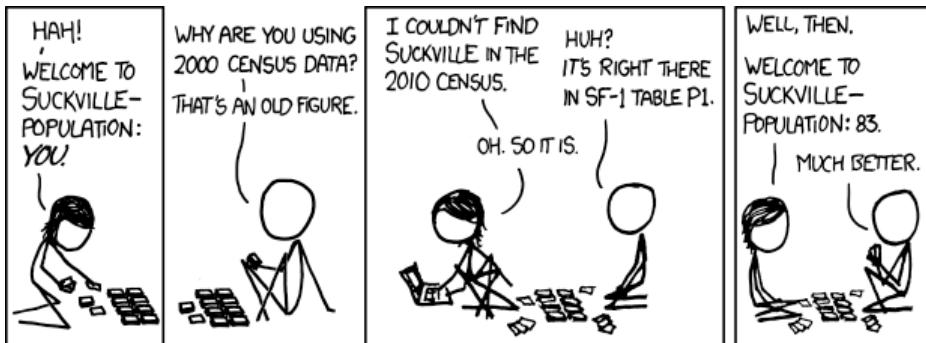
Suckville is considered by the Census Bureau to be part of the Detroit metropolitan statistical area, despite not being located anywhere near Detroit.

Explanation

Megan and Cueball are playing a card game (possibly Dominion) and Megan whips a common insult, a play on the word "suck" that adds a typical city name suffix to the end of it. Other variations are: "Losercity", "Lameville", etc.

The phrase is originally based on the ubiquitous signage you see along American roads that say "Welcome to Town X — Population Y".

Then, since Cueball one-ups Megan by indicating there is a city by that name, she can only resign herself to the fact that her smack talk did not work. Since Cueball knows where Suckville can be found in the census data, it's likely that he has received this insult in the past (maybe even from Megan) and searched through the census data to prepare a comeback for this time.

The title text informs the reader that Suckville is classified as part of the Detroit area despite not being located there. Detroit, of course, is the quintessential example of a city so run down, it might as well really be named "Suckville", or include a district of that name. In fact, the city only recently (2013) declared itself bankrupt.

(Fun fact: looking in the US Census Suckville is "corrected" to Saukville, Wisconsin, which is indeed not particularly close to Detroit, Michigan. However the population of Saukville in the 2010 census is given as

4451 for the village, and 1755 for the surrounding town municipality.)

#1009: Sigh

January 27, 2012

If you're annoying enough, you can get them to respond with an involuntary second sigh and get a rhythm going.

Explanation

Cueball is mispronouncing the name of the British TV show, also available in the US, Downton Abbey. Mispronouncing the title as DownTOWN Abbey causes Megan to sigh because it is such a common and stupid mistake to fans of the show. Mispronouncing the title changes the meaning from being about the eponymous Yorkshire Country Estate (pronounced doun-tuhn ab-ee /ˌdaʊntən ˈæbi/) to being about a monastery in the midst of a large city (incorrectly pronounced doun-toun ab-ee /ˈdaʊnˌtaʊn ˈæbi/). In the UK the CBD, the Central Business District (the big middly bit), is simply called the "city centre".

LMFAO was, at the time of this comic's upload, a ubiquitous group in the US on radio, TV and even strange commercials with rodents riding in cars with their song, Party Rock Anthem. However, this comic is a reference to another one of their songs, "Sexy And I Know It." The relevant lyrics are:

The title text is referring to the multiple uses of that lyric throughout the song, creating a steady rhythm.

#1010: Etymology-Man

January 30, 2012
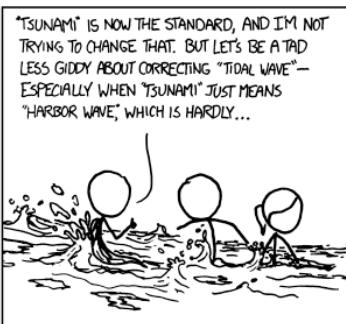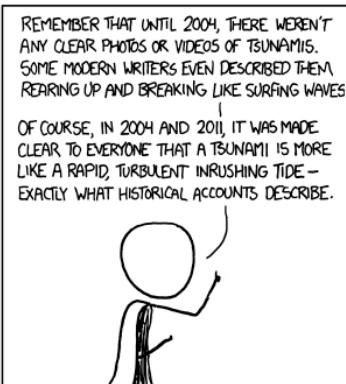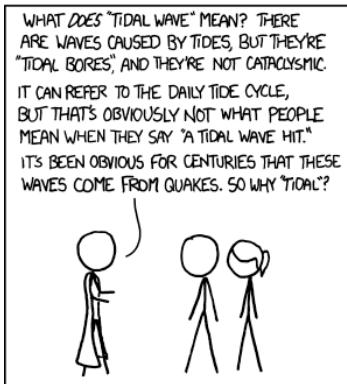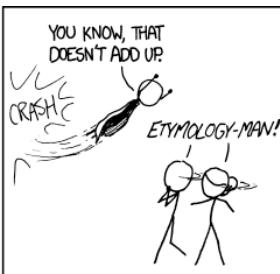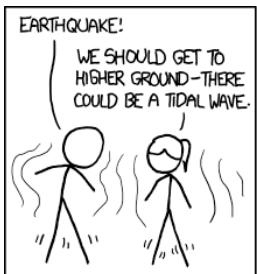
'I can't believe I'm saying this, but I wish Aquaman were here instead--HE'D be able to help.'

Explanation

This became the first comic in a two comic series about the Etymology-Man. The second followed two comics later in 1012: Wrong Superhero.

This comic is a take on the traditional appearance of a super hero when a disaster strikes. In this case, Etymology-Man arrives, who apparently has the power of Etymology — the study of the history of words, their origins, and how their form and meaning have changed over time. As Etymology-Man is explaining the history of the words "tsunami" and "tidal wave", referencing the 2004 Indian Ocean tsunami, the 2011 Tōhoku tsunami and the 1755 Lisbon earthquake and tsunami, the water starts rising around them. As the waters continue to rise, he continues to only explain the words, rather than attempting to save them as a superhero should. This, intentionally or unintentionally, is a dig at academics who prefer to talk about issues when taking action is more appropriate.

Etymology-Man's explanation in the comic focuses on the historical and linguistic reasons for the use of the term "tidal wave" instead of "tsunami." While "tidal wave" is often corrected as a misnomer, Etymology-Man argues that its historical usage may not have been entirely misguided. He points out that early accounts of large waves, such as those from the 1755 Lisbon earthquake and tsunami, described their behavior as resembling a rapid and turbulent tide rather than a breaking wave.

This distinction aligns with modern understandings of tsunamis as inrushing surges of water rather than surf-like waves. The 1755 Lisbon earthquake and tsunami devastated much of Lisbon and other coastal regions, with eyewitness accounts describing the ocean withdrawing and then rushing back violently, which could have influenced the term "tidal wave" to describe this tidal-like phenomenon. Etymology-Man suggests that instead of being rooted in scientific confusion, "tidal wave" might have been a descriptive term reflecting the wave's observable form. Furthermore, he notes that before the 2004 Indian Ocean tsunami and the 2011 Tōhoku tsunami, clear photographic or video evidence of tsunamis was rare. This lack of visual records likely contributed to misconceptions about their appearance, with some imagining tsunamis as tall, surfable waves. The widespread coverage of these modern events clarified that tsunamis are more like fast-moving, chaotic floods, further validating historical descriptions that likened them to tides. Etymology-Man's argument underlines the importance of understanding linguistic evolution and context, suggesting that the rush to replace "tidal wave" with "tsunami" might have overlooked the historical accuracy of the former term in certain respects. While he acknowledges that "tsunami" is now the accepted term, his lecture encourages a nuanced view of language history, even in the face of imminent danger.

Also, the title text is a play on how useless Aquaman is (perceived to be) compared to other superheroes, as his powers — breathing underwater, speed swimming, and

communicating with sea life — are very difficult for writers to make relevant, since most stories do not take place underwater.[citation needed] Indeed, in the case of a flood, Aquaman and his aquatic allies would be able to assist with evacuations. (Some depictions of Aquaman do not have control of water itself. Though when equipped with his mystical trident, or magical prosthetic "water hand", could probably also perform useful hydrokinesis to avert significant damage.)

The irony of the situation comes from the fact that Etymology-Man seemingly has the power of flight and could in fact save Cueball and Ponytail if he was not so busy talking about the origin of the word "tidal wave".

Inexplicable is the fact that Cueball and Ponytail both know exactly who this "superhero" is, and ergo presumably realize that what he is telling them is useless, but they don't even attempt to get to safety. There are few possible explanations for this: perhaps they are simply accepting their fate instead of trying to escape, or even that learning cool word facts takes precendence over saving their own lives, or they have been distracted by Etymology-Man's lecture and were caught by surprise by the fast tidal wave.

#1011: Baby Names

February 01, 2012

Names for daughter

1. Ponzi
2. Eeemily
3. Fire Fire
4. Chipotla
5. Astamouthe
6. Eggsperm
7. [sound of record scratch]
8. Parsley
9. Hot'n'Juicy Ann
10. Ovari
11. Friendly
12. Sean (pronounced "seen")
13. Joyst

I've been trying for a couple years now but I haven't been able to come up with a name dumber than 'Renesmee'.

Explanation

This comic is a list of comically terrible baby names invented by Randall. It may relate to his other comics about why he shouldn't be allowed to have access to babies.

This is a list of the names with a short description:

- Ponzi - An Italian surname, most often associated with "Ponzi scheme".
- Eeemily - A corruption of "Emily". May also be a marketing plug for the Asus Eee brand.
- Fire Fire - Even a single "Fire" would be odd as a name, at least in the American dialects. It would also not be a good idea to call your child's name in a crowded place.[citation needed] This name could also be the inverse of "Ice Ice", a common joke baby name referencing Ice Ice Baby.
- Chipotla - A frequent mispronounciation of chipotle chili or the popular Chipotle Mexican Grill restaurant chain. Many people would readily attempt to correct you when you called your child's name. Possibly reads as a feminine version of chipotle.
- Astamouthe - Could be pronounced "Ass to mouth".
- Eggsperm - A child is conceived by combining an egg and a sperm, this child's name is conceived by combining the names of the two things.
- [sound of record scratch] - This cannot be spelled or

reliably pronounced.[citation needed] Likely a reference to any movie where a record scratch plays and the protagonist says "that's me".

- Parsley - Parsley is an herb and is not commonly used as a name unlike other herbs like Rosemary and Sage. It is, however, probably the least terrible name on this list.
- Hot'n'Juicy Ann - "Ann" is a normal name. Prefacing it with the sexual "Hot'n'Juicy" would not be appropriate for a child's name.
- Ovari - Female reproductive organ, misspelled.
- Friendly - Odd enough on its own, but when referring to her possessions it would create confusion with the restaurant Friendly's. Can also be humorous in introductions - "Hi I'm Friendly and I hate you."
- Sean (pronounced "seen") - While this isn't an incorrect pronunciation, the more common pronunciation would be "Shawn". Very likely a reference to the name of the actor Sean Bean (whose name is pronounced Shawn Been), which uses the exact same pairing of letters for two pronunciations.
- Joyst - Corruption of "Joyce". May also refer to the term "joist", which is a beam used in construction to support ceilings or floors, or the first part of the word "joystick", a video game controller.

A further analysis of baby names is presented by Randall in the Blag post "The Baby Name Wizard".

Renesmee (from the title text) is the name of Renesmee Cullen, who is the baby born in the book and movie

Breaking Dawn to parents Edward and Bella. Edward and Bella get "Renesmee" from an amalgamation of the names of Bella's mother, Renée, and Edward's adoptive mother, Esme. Randall's point is that all those names are terrible, but (arguably) not nearly as terrible as the name Renesmee.

#1012: Wrong Superhero

February 03, 2012
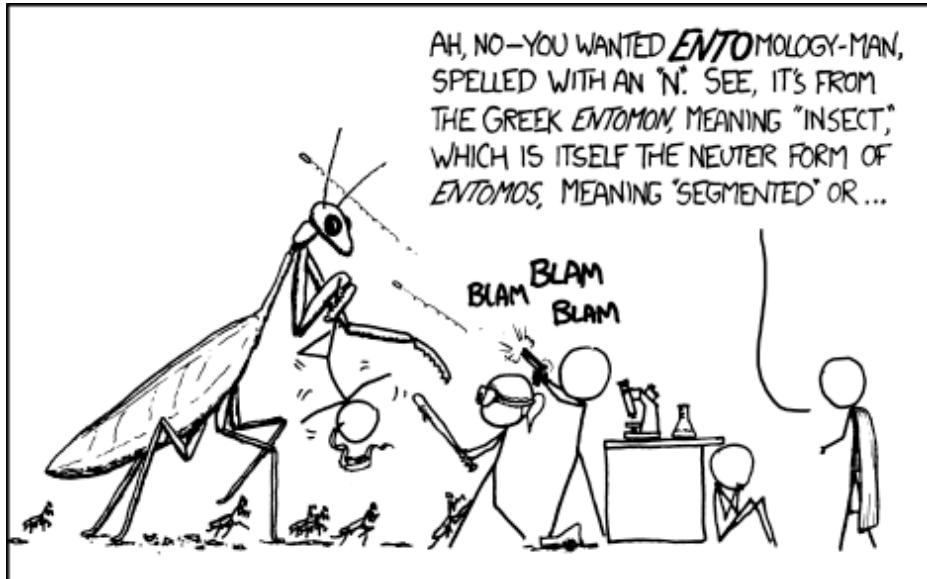
Hi! Someone call for me? I'm a superhero who specializes in the study of God's creation of Man in the Book of Genesi-- HOLY SHIT A GIANT BUG!

Explanation

This is the second of the two comics in the series about the Etymology-Man. The first came two comics before with 1010: Etymology-Man.

The superhero, Etymology-Man, returns. And just like in his first appearance, Etymology-Man is explaining the origination of words instead of actually helping. Etymology is the study of the history of words, their origins, and how their form and meaning have changed over time.

In this comic, a group of scientists is in a lab, fighting off a giant mantis and some smaller mantises (which are nonetheless much larger than a typical praying mantis. Compared to the size of the people in this comic, the smaller mantises appear to be 8-12 inches long). One Cueball is firing a gun and Ponytail is brandishing a baseball bat, while the giant mantis grabs one Cueball by the leg, dangling him upside down. Behind the table, another Cueball is listening to Etymology Man speak. The joke here is that the scientists called the wrong hero for help. They instead wanted Entomology-Man. Entomology is the study of insects. Instead of calling Entomology-Man, who could probably help with fighting off the mantises, they have accidentally called Etymology-Man, due to the similarities in their names. Etymology-Man can only explain the origin of words, making him useless in this current situation. He also has flight powers that could be used to evacuate the

scientists, but as seen in 1010: Etymology-Man, etymology takes full priority for him.

In the title text, we find out the scientists accidentally call another superhero focused on Adam in the Biblical book of Genesis. This might be Etiology-Man (the study of causation and attribution), Ontology-Man (the study of being and existence), Ethology-Man (the study of human character, with a focus on its formation and evolution). Or perhaps Anthropology-Man or Anthropogeny-Man.

#1013: Wake Up Sheeple

February 06, 2012

You will be led to judgement like lambs to the slaughter--a simile whose existence, I might add, will not do your species any favors.

Explanation

Cueball is going through the traditional street-protester refrain about the government having control over our lives and shouts "wake up, sheeple!" through a megaphone. Sheeple is a portmanteau of sheep and people used as a derisive term to describe people who thoughtlessly wander through their daily lives going exactly where they are "herded" by the powers that be.

However, in this comic, the Sheeple are humanoid sheep-men who have slumbered beneath the Earth for ten thousand years, and whom Cueball has inadvertently awoken with his repeated mantra, similar to saying "bloody mary" in a mirror three times (much as in 555: Two Mirrors). The Sheeple appear to be some kind of eldritch abomination who will destroy the human race, and judging from Megan's reaction and the off-panel voices, Cueball seems to be the only one previously unaware of their existence.

The title text says the humans will be led "like lambs to the slaughter" which is a phrase that appears many times in older texts, the Bible as an example. The phrase means that someone or something would be led to its destruction without it thinking to escape from the disaster. The Sheeple are likely to take it amiss, because it indicates the uncaring frequency with which humans kill juvenile sheep.

See more Sheeple-related comics at Category:Sheeple.

#1014: Car Problems

February 08, 2012
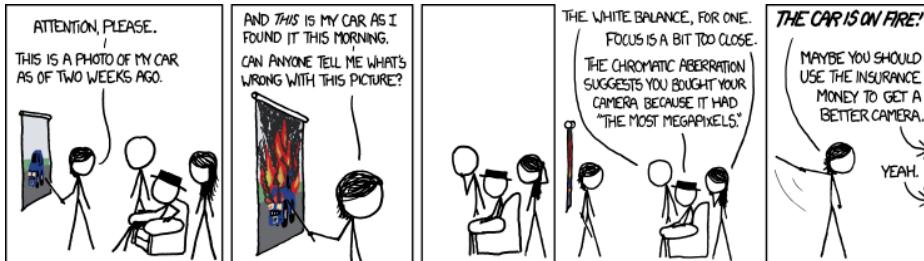
Or if you replace your car, we'll be happy to set it on fire again so you can take another crack at getting that shot.

Explanation

Megan's car appears to have combusted at some point while she left it unattended. Suspecting her friends and acquaintances Cueball, Black Hat and Danish of perhaps having something to do with it, she gathers them in front of a couch and draws attention to the fact that something is just a little bit wrong with the two juxtaposed images she shows them. When she asks What is wrong with this picture, they all three take this question literally and start critiquing the picture quality, and not the subject, feigning complete ignorance about the car being on fire. When Megan exasperatedly tells them what is wrong with the picture —that her car is on fire!— they continue to act evasive by telling her that she should buy a better camera. But at least here they acknowledge that the car is on fire, as they suggest she uses the insurance money (from the car) to buy this better camera.

The title text and the dialogue suggest that Megan's friends aren't being evasive to avoid telling her the truth, they are just doing exactly what they were told. They patiently and correctly describe what is wrong with the picture. If Megan had wanted to know what was wrong with her car, then she should have asked that directly. Her friends are just being friendly when they offer to help her create the scene [again] so that she can shoot the picture correctly. And the "again" proves that they did set the car on fire, and they are not trying to deny this. But for sure they are messing with her, both by setting her car on fire, deliberately understanding her question in

another way than she intended, and then even suggesting that they will set her new car on fire as well.

As for the particular details of the digital photography terms mentioned:

- White balance: Artificial indoor light is more yellow, outdoor light is more blue. The light color can also depend on weather or time of day. The human eye is a very good judge of whiteness under a variety of lighting conditions, digital cameras often have difficulty automatically correcting for this which can cause images to look too blue or orange. Professional cameras and image editing software allow you to adjust the white balance manually, which Megan presumably has not done.
- Focus is a bit too close: As light passes through a camera lens, it is bent until the rays converge on the film or sensor. If the focus is too close, it implies that point of convergence from the light of the subject is slightly in front of the sensor (i.e. that Megan has accidentally focused on something closer than the car). This will result in near objects being (too) sharp, and the car being slightly blurry.
- Chromatic aberration: This causes colored artifacts in an image, typically caused by cheap lenses, which do not focus light of different wavelengths (and thus different colors) in the same way. It is usually visible as a blueish or reddish outline around objects.

It was mentioned again much later in 1791: Telescopes:

Refractor vs Reflector, but here it actually has something to do with the subject of the comic...

- Megapixels: This is the number of image sensor elements of digital cameras or the pixels on digital displays. More pixels improve the resolution but can also result in less overall quality for the pictures, due in part to the reduced size of each pixel sensor (because the total sensor size is typically the same for a given class of camera), and because for consumer-targeted products the total engineering budget is limited, so that extra money spent on a high megapixel sensor ends up reducing the money spent on other elements such as the lenses.

While this comic focuses on misunderstandings by people viewing pictures this could be also a reference to the battery fire in a stored, damaged Chevrolet Volt automobile. During a side-impact safety test, which the car passed with a five star rating at Popular Mechanics, its high voltage battery pack was damaged. Part of the test procedure includes rolling the vehicle over after the impact to check for leaking fluids; during the rollover check, the vehicle electronics were flooded with coolant. The damaged vehicle was then put into storage where its high voltage battery remained energized; three weeks later the battery spontaneously caught fire, potentially due to corrosion, and destroyed the car. GM subsequently made design changes to address the causes of the fire.

Megan's car also caught fire in 1693: Oxidation, but this time she knew for sure who did it, so no direct relation to

this comic, except the poor luck Megan has with her cars.

#1015: Kerning
February 10, 2012

IF YOU REALLY HATE SOMEONE, TEACH THEM TO RECOGNIZE BAD KERNING.

I have never been as self-conscious about my handwriting as when I was inking in the caption for this comic.

Explanation

In typography, kerning refers to the spacing between consecutive letters in printed material or the process of adjusting said spacing. Bad kerning is thus text that has so much space between letters of one word that it appears to be two words, or so little space between letters that they run together. A common kerning issue is an "r" and an "n" together looking like an "m". (This latter case has resulted in the slang term "keming" for this type of kerning.) Extreme behavior of bad kerning can lead to humorous or inappropriate text.

Proper kerning is more difficult than it sounds. If one were to imagine each letter as existing inside a rectangle, "A" and "V", for example, happen to be negatives of one another space-wise, and as a result if an "A" was simply set alongside a "V" (or vice versa) where the rectangles do not overlap, the spacing would end up looking unusually large. Thus, "AV" and "VA" sequences have to be specially programmed to overlap slightly.

Kerning has been an issue in typography since the early era of printing presses and movable type but has taken on new challenges with digital printing. Typical non-designers using basic word processing software don't pay much attention to kerning. A good graphic designer, however, can compensate for bad kerning by individually adjusting the spacing between problem letters. People who specialize in graphic design or layout (and, thus, who are exposed to digital text on a regular basis) can

become hyper-sensitive to bad kerning, seeing it in signs or other printed materials prepared by people without such sensitivity to bad kerning.

One example of bad kerning is the font Comic Sans. The kerning is very low quality, which is one reason as to why graphic designers have a disliking for it.

In the comic, the kerning in the sign is badly done: the spacing between C and I (in "City"), between C and E (in "Offices"), and even slightly between F and I (also in "Offices") is inconsistent. The space between the C and E is almost as wide as the space between the words. One character is clearly frustrated while the other character doesn't notice the problem at all.

The comic explains that once a person learns what good kerning is, they will get irritated by shoddy kerning in the future. And since it is very irritating to be annoyed every time this happens, Randall suggests that you teach this to someone you really hate. Unfortunately, the comic itself has also taught us to be annoyed. Thanks, Randall.

Kerning was mentioned in the title text of 590: Papyrus, a comic about the font Papyrus. The suggestion of teaching someone about kerning to annoy them sounds like it could become a new hobby for Randall.

The title text is written by Randall explaining that as he was writing this comic about kerning, he was very self-conscious of his own handwriting. The act of thinking about kerning (and likely, the act of drawing an

example of such bad kerning) made him aware of it in his own writing, and in fact, he kerns the caption oddly, with, for example, the T in "them" hanging over the top of the H, but this is a common quirk of his.

The comic has a parallel with 972: November, which also suggests the idea of annoying a person by calling their attention to something which usually does not merit it.

#1016: Valentine Dilemma

February 13, 2012

The worst resolution to the Valentine Prisoner's Dilemma when YOU decide not to give your partner a present but your PARTNER decides to testify against you in the armed robbery case.

Explanation

Both Megan and Cueball are agonizing over what to get each other for Valentine's Day. Both of them seem to have a similar mindset towards the holiday: that it's arbitrary, imposes a set of demands and expectations, and is used by corporations to mandate consumerism. At the same time, both are aware that rituals and social expectations are important to other people, and so are torn between their distaste at following contrived rules and their concerns about being inconsiderate.

In the 6th frame, Megan worries that Cueball might get her something and be hurt if she didn't reciprocate, explictly referencing the prisoner's dilemma. This dilemma is a classic thought experiment in game theory, in which two accused criminals are given the opportunity to testify against one another, but not allowed to communicate. The offer is set up so that the best total outcome for both prisoners is if neither testifies. But each individual prisoner, not knowing what the other will choose, may personally benefit from turning on the other (or give away this advantage if they, alone, choose not to). In a similar way, Megan and Cueball might both be most satisfied if neither buys a gift, but neither wants to take the risk of looking inconsiderate (and apparently aren't open to communicating about it).

The ultimate resolution is that neither gets the other a conventional gift. Cueball buys Easter candy (candy is a common Valentine's day gift, but the Easter theme

makes it less cliche) and a jar of hammers, which clearly isn't an expected romantic gift.[citation needed] Megan panicked and, even more inexplicably, staples her hand to her face. There's something sweet in the fact that they're both equally befuddled by this social ritual, but they recognize that they've been badly overthinking what should be a fairly simple interaction.

The title text combines the two dilemma scenarios in an absurd juxtaposition, with the reader ("you") choosing with one person choosing not to get a gift (from the Valentine's Dilemma) and the other choosing to testify in a criminal case (from the prisoner's dilemma).

The Prisoner's Dilemma has been referenced before, in 696: Strip Games.

#1017: Backward in Time

February 14, 2012

People tell me I have too much time on my hands, but really the problem is that there's too much time, PERIOD.

Explanation

As far as the actual math is concerned, the formula is an exponential function (i.e. the variable appears in the exponent). The effect that the function grows faster and faster as p grows, is due to T(p) being exponential. More precisely, when you repeatedly add some constant to the exponent, you will repeatedly multiply some (other) constant with the value of the function. Compare how "slow" a value grows by adding even high values (1, 1001, 2001, 3001, 4001, 5001...) and how fast it grows by multiplying even low values (1, 10, 100, 1000, 10000, 100000...)
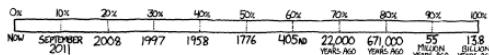
Now, the function has to be adjusted so that, as Randall put it, "the time spent in each part of the past is loosely proportional to how well I know it." The most important adjustment is putting p to the power of three. That lowers the amount added to the exponent for low values ($0.1^3=0.001$, $0.2^3=0.008$, i.e. only 7/1000 have been added for 10% workflow) and increases the amount for high values ($0.8^3=0.512$, $0.9^3=0.729$, i.e. more than 1/5 has been added for 10% workflow). That means the recent past will pass even slower and the historic past even faster than it already does by choosing an exponential function.

The remaining adjustments are technical. The coefficient in front of p^3 adjusts the constant by which the result will be multiplied while adding some constant to p, while it also roughly ensures that p=1 yields the lifetime of the

universe. The 3 added to the product in the exponent further adjusts the actual values of the power without touching the slope (the multiplicative constant). In the parentheses, e^3 is subtracted to put the time to 0 when p=0. Otherwise the function would start approx. 20 yrs and 1 month ago. For bigger p, this offset does not matter much. Imagine subtracting 20 yrs from the lifetime of the universe!

Finally, the result is subtracted from the current date for aesthetical reasons. The formula could tell you "20 years ago", or it could read "February 1992". Randall decided the latter would be better. The punchline "Swoosh!" is about how fast the last few percents of Cueball's download happen in "such a rush". For most humans waiting for a download to complete tends to become really boring and progress would instead seem to get slower and slower.

(Also, the workout website, Fitocracy has been mentioned previously in xkcd.)

Note that as of the time that this page was last cached, the comic was uploaded at 15.745607593273% progress.

#1018: Good Cop, Dadaist Cop

February 17, 2012

NOW INVENT AN IMPOSSIBLE-TO-TRANSLATE LANGUAGE AND USE IT TO TELL US WHERE THE MONEY IS.

Explanation

This comic is a play on the well known Good Cop/Bad Cop (where one interrogator is nice and friendly and the other is mean and intimidating) police interrogation strategy and the artistic movement Dadaism.

Dadaism is an artistic movement which by its definition is irrational. The movement embraces the free flow of unreasoned thought and prizes nonsense and rejection of established norms. As such, the entire concept of "Good Cop, Dadaist Cop" could be considered a dadaist concept in itself.

"Good Cop/Bad Cop" is a psychological tactic that may be employed during joint questioning or interrogation. The interrogators isolate the suspect, then one of the interrogators (the "bad cop") acts aggressively and threatens the suspect and the other (the "good cop") acts friendly and helpful in comparison, offering the suspect reassurance and protection from the bad cop if they co-operate. If successful, it deceives the suspect into believing they must choose to trust one of the interrogators and the suspect chooses to co-operate with the good cop, or merely complies out of fear of the bad cop.

The comic starts with the "Good Cop", the male police officer, and the "Dadaist Cop", Ponytail, working out their plan to interrogate the suspect, Hairy. After the Good Cop makes a few statements, intended to build

trust with Hairy, and leaves to get coffee, Ponytail enters the interrogation and starts asking Hairy absurd questions. Hairy quickly becomes agitated, and questions what is wrong with Ponytail. Ponytail responds "What's wrong with ART?", which could suggest she believes the interrogation is artwork and should not be questioned. On the other hand, actual responses would break the Dadaism pattern.

Good Cop/Bad Cop hinges on the suspect's fear and distrust of the intentions of the bad cop; thankfully for the police, Ponytail's "Dadaist Cop" seems to be a successful Bad Cop too, judging by the suspect's fear of her irrational, unpredictable, and potential crazy behavior (not to mention loud and aggressive mannerisms).

The title text builds on the joke as by asking a suspect to give the whereabouts of the money in a dadaist manner, which would be completely useless in finding it. Such a statement could be used as a confession though.

Irrationality[edit]

• "See this? It's Mark Zuckerberg's mortgage. So why is it written in Church Latin?"

Mark Zuckerberg (the co-founder of Facebook) was renting in 2011 and therefore did not have a mortgage.

Even if Mark Zuckerberg had bought a property, it is unlikely (given his financial status) that he would have to take out a mortgage.

Modern mortgages are typically written in the local vernacular; it would be very strange for one to be written in a dead language like Church Latin.

- "WHY ARE MY BONES SO SMALL?" "What's wrong with ART?"

These are non sequiturs and therefore have no place in an investigation.

- "NOW INVENT AN IMPOSSIBLE-TO-TRANSLATE LANGUAGE AND USE IT TO TELL US WHERE THE MONEY IS." (title text)

The location of the money cannot be conveyed to Ponytail if the information were expressed in a newly invented language that cannot be translated, and therefore would be useless to an investigation.

#1019: First Post

February 20, 2012

$1,500,000

$200,000

COST TO BUY AN AD ON EVERY STORY ON A MAJOR NEWS SITE EVERY DAY UNTIL THE ELECTION

COST TO PAY FIVE COLLEGE STUDENTS $20/HOUR TO CAMP THE SITE 24/7 AND POST THE FIRST FEW COMMENTS THE MOMENT A STORY GOES UP, GIVING YOU THE LAST WORD IN EVERY ARTICLE AND CREATING AN IMPRESSION OF PEER CONSENSUS
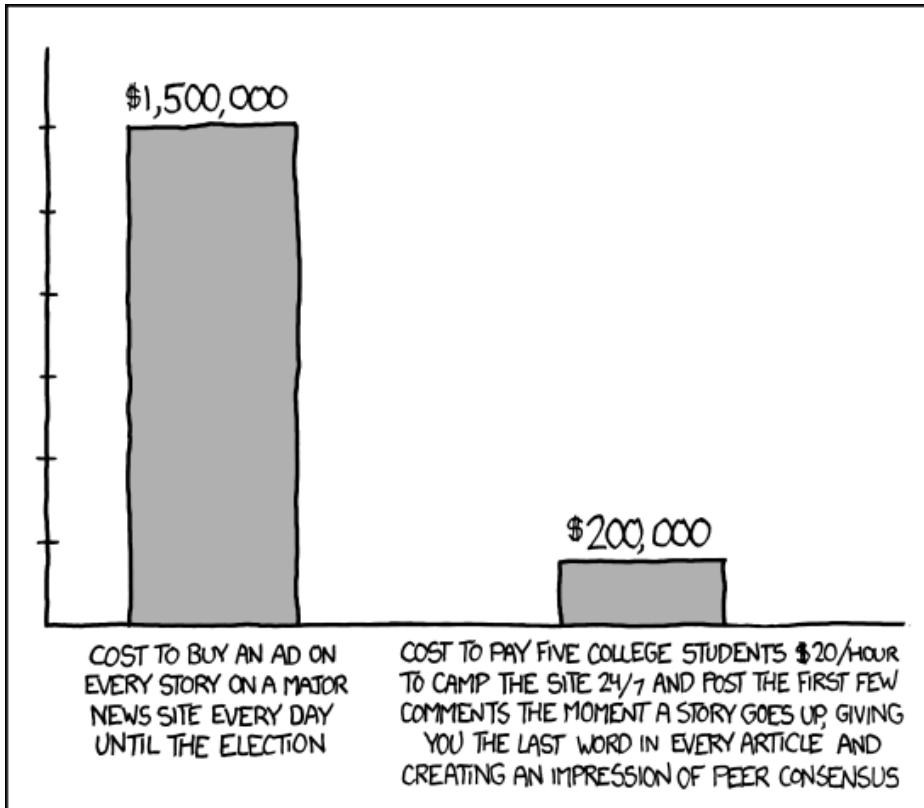
THE PROBLEM WITH POSTING COMMENTS IN THE ORDER THEY'RE SUBMITTED

'Nuh-uh! We let users vote on comments and display them by number of votes. Everyone knows that makes it impossible for a few persistent voices to dominate the discussion.'

Explanation

Many news websites allow users to post comments on an article. The intention is that users can debate the stance(s) or implication(s) made by the article. On most sites, comments are displayed in chronological order. This puts the oldest comments at the top and newest at the bottom.

There are many pitfalls to allowing comments, but this comic refers to one in particular: most users are too busy to read more than just the top few comments. Therefore, if you were able to control the content of those comments, your opinions would be the ones that the majority of users read. If you pay people to do nothing but read the site, you ensure that they will be the first ones to see the article and that their comments (that you pay them to write) will be at the top of the page. In this scenario, the comments being posted appear to convey a particular political belief. The advantage of this is, according to Randall, that it would be much cheaper to employ a college student to perform that task than pay a website for an advertisement. Also, the fact that it is a comment posted by another reader would make it seem as though the opinion was coming from the general population and not a politician or company, as an advertisement would imply. And $20/hour was (and as of this writing still is) significantly higher than the minimum wage, so you'd have no trouble finding willing participants among college students (who are often broke).

This comic is a continuation of 937: TornadoGuard which stated "the problem with star ratings". Apparently, every possible comment ordering policy has its own problems.

The title text refers to systems like Reddit's conversation threading which allow users to vote comments up or down and to sort them by the resulting "karma score" (total up-votes minus total down-votes). The hired students could easily be assigned to also upvote each other's posts. Even without collusion, the same problem persists to some extent: after a few comments are posted and some votes are cast, the handful of comments having received the highest scores among the first dozen of so will receive far better chances at being seen and voted on than comments posted later, and will solidify their places in a positive feedback loop. In this way, a few persistent voices can still dominate the discussion, contrary to the claim in the title text, thus creating irony.

The comic's title refers to a once-common form of online posturing where the first user to see the article will comment "First post" or even just "First". The intent is that everyone else see that they were there first and, therefore, must be somehow better than you. This is referred to in both 269: TCMP and 1258: First.

Since this comic's publication several news sites have elected to remove all comments, in part to prevent a few voices dominating the conversation.

In 2159: Comments, this strip is mentioned, along with

the text "This dynamic is so easily manipulated and it freaks me out."

#1020: Orion Nebula

February 22, 2012
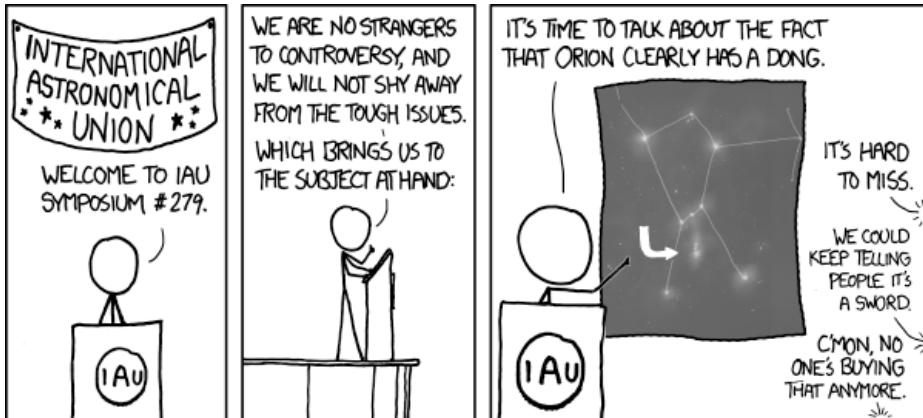
Also on the agenda: what's with his hips?

Explanation

The Orion nebula is a diffuse nebula situated south of the three stars that compose Orion's Belt in the Orion constellation. In terms of the comic, it is the middle "star" in the sword/dong of Orion. Dong is an American slang word for penis. The star appears fuzzy to sharp-eyed observers, and the nebulosity is obvious through binoculars or a small telescope.

When the speaker says "We are no strangers to controversy," he is probably referring to Pluto's demotion from planet to a dwarf planet/plutoid.

The title text is a quip about how small and off-kilter the hips are in Orion the constellation compared to the rest of its body, although his hips are not far off the modern comic-style "Captain Dorito" body type, with a degree of posing in partly side-on perspective. There are various different depictions of Orion, according to the selective interpretation of the viewer/illustrator.

#1021: Business Plan
February 24, 2012
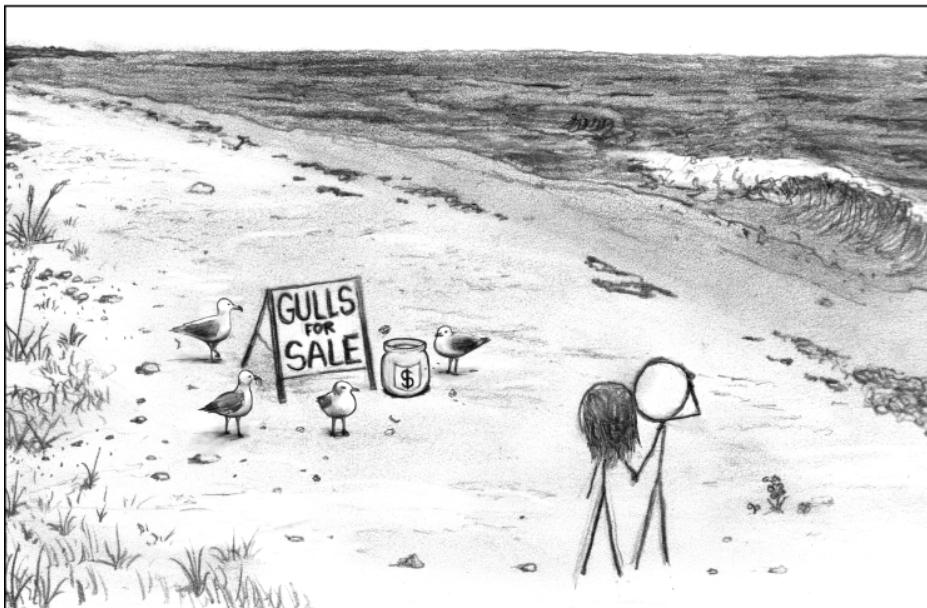
The investor elevator pitch is "Wheeeeeeee! Elevators are fun!"

Explanation

This one has the art and feel of very early xkcd comics, even though those stick figures did not appear by that time.

Beret Guy has developed (or spontaneously implemented) a "business plan" whereby he lures seagulls to an area of a beach utilizing breadcrumbs. Once the gulls converge on the area, he sets up a sign reading "GULLS FOR SALE" with a jar for money. Though Beret Guy probably expects to profit, the confused reactions of other people in the last panel indicate nobody is buying, and the limited number of gulls, four, is low enough that their sale might not even finance the breadcrumbs. In real life, there is no market for seagulls, nor will there ever be in the foreseeable future.[citation needed]

The title text is a reference to the phrase "Elevator pitch", which is also similar to "investor pitch". The point of an elevator pitch is to have a synopsis of your idea that you are capable of delivering on a moment's notice in the time it takes to ride the elevator, about 30 seconds. This way, when you get that once-in-a-career opportunity to pitch your plan to the one person who can make it happen because you just happened to catch the same elevator, you are ready. The reason the elevator pitch is so simplistic is because the same sort of person that would think selling seagulls is a viable business model is likely the same sort of person to make a childish elevator pitch.

This also pokes fun at the idea of people sweating over their pitch with such seriousness, when Beret Guy's pitch is literally a childish exclamation. Wheeee!

#1022: So It Has Come To This

February 27, 2012

WE RAN OUT
OF CAT FOOD.

SO
IT HAS COME TO THIS.

PROTIP: IF YOU'RE NOT SURE WHAT TO SAY, TRY "SO IT HAS COME TO THIS"—IT CREATES INSTANT DRAMATIC TENSION AND IS A VALID OBSERVATION IN LITERALLY ANY SITUATION.

'Come to what?' 'You. Me. This moment.'

Explanation

The line "it has come to this" is usually seen on the verge of the climactic confrontation between the villain and their arch rival, or when one character has to unleash their utmost ability, etc. Despite its dramatic tone, however, the statement is a content-free tautology, true in all possible scenarios in which time progresses in a forward direction. Accordingly, Cueball is saying it when Megan tells him that they have run out of cat food, a relatively trivial problem that could be solved with a quick trip to the grocery store.

The title text is a follow-up on the comic dialogue. When Megan replies in confusion, "Come to what?" Cueball then uses another instantly-dramatic phrase that keeps his words ambiguous, only leaving her in the dark.

Other comics which advocate using catch-all phrases as standard responses for any comment:

- 174: That's What SHE Said
- 178: Not Really Into Pokemon
- 559: No Pun Intended
- 1215: Insight
- 1627: Woosh
- 1656: It Begins

#1023: Late-Night PBS

February 29, 2012

Panel 1:
HAVE YOU EVER WATCHED PBS LATE AT NIGHT?

I FELL ASLEEP AFTER DOWNTON AND WOKE UP AT LIKE 3 AM.

Panel 2:
WHERE IN THE WORLD IS CARMEN SANDIEGO WAS BACK ON, EXCEPT THE HOST HADN'T AGED WELL AND HE'D CLEARLY BEEN DRINKING.

EVERY QUESTION TOOK THEM TO SOME HORRIBLE PLACE LIKE MOGADISHU OR THE CAMBODIAN KILLING FIELDS.
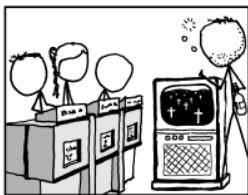
Panel 3:
THE KIDS WERE FREAKED OUT, BUT THEY KEPT PLAYING. EVENTUALLY THEY WERE TOLD THEY'D FOUND CARMEN SANDIEGO HIDING BEHIND A BOOKSHELF IN A DUTCH APARTMENT.

Panel 4:
THE CHIEF APPEARED AND ASKED "ARE YOU *PROUD* OF WHAT YOU'VE BECOME?"

THEN ROCKAPELLA WALKED OUT AND JUST GLARED AT THE KIDS UNTIL THEY STARTED CRYING.

I, UH, DON'T REMEMBER THE OLD SHOW BEING THAT DARK.

MAYBE WE WERE TOO YOUNG TO PICK UP ON IT.

Then it switched to these old black-and-white tapes of Bob Ross slumped against the wall of an empty room, painting the least happy trees you've ever seen. Either PBS needs to beef up studio security or I need to stop using Ambien to sleep.

Explanation

This comic examines the way the world seems different for adults today compared with how we remember it as a child, due to complex subtext or naïvety, to a humorous extreme, and with a specific reference to television programs for children.

PBS is a US public television network known for highbrow and educational programming, and shows a high proportion of BBC programming. The show Where in the World Is Carmen Sandiego was a light-hearted educational game show that ran from 1991 to 1995. In the show players followed geography-based clues to find out where a master criminal, Carmen Sandiego, was going, and catch her. After catching (or failing to catch) Carmen Sandiego, a character called The Chief would congratulate or encourage the players. Rockapella was an a cappella band featured on the show that gave clues, punctuated the show with humor, and closed the show.

Megan recounts her surprise as to the nature of programming on late night PBS to Cueball. She claims to have fallen asleep after watching Downton Abbey and woken up to see that Where in the World Is Carmen Sandiego is still making new episodes, but is significantly darker than she remembers it. The host has aged poorly (the show would have been off the air for 20 years) and developed a drinking problem; the locations the child contestants visit are traumatizing; and the children are clearly freaked out. In the end they find Carmen

Sandiego hiding behind a Dutch bookcase, an allusion to The Diary of Anne Frank, thus implying that instead of aiding legitimate law enforcement in finding thieves they have been aiding the Nazis in their search for Jews (and others) to murder. The Chief admonishes the children for their actions and Rockapella glares at the children disapprovingly until the children break down in tears.

After Megan concludes her story, Cueball remarks that he did not remember the show being that dark. In response Megan replies that as kids, they may not have been able to understand the darker subtext of the show. It is true that some programs intended for children often have subtle themes for adults who may be watching the show with their children that the children do not usually remember or pick up on. The joke is that although young viewers may not be able to pick up on everything, they would certainly have noticed if the show was as dark as Megan described.[citation needed]

The title text describes the next program, an episode of The Joy of Painting, in which a depressingly weary painter paints unhappy trees. This contrasts with the usual mood of the show where Bob Ross was upbeat and the components of his paintings were described as "happy little" objects. Megan then postulates that either people are breaking into the television station to produce horrible programming, or she is experiencing hallucinations due to her sleep aid Ambien. This gives hallucination as an alternate explanation for the main comic.

Locations visited[edit]

- Mogadishu is the battle-torn capital city of Somalia, where the "Battle of Mogadishu" took place in 1993, which would coincide with the air dates of Where in the World Is Carmen Sandiego.

- The Killing Fields are a number of sites in Cambodia where large numbers of people were killed and buried by the Khmer Rouge regime, during its rule of the country from 1975 to 1979, following the end of the Cambodian Civil War (1970-1975).

- "A bookshelf in a Dutch apartment" is a reference to Anne Frank, a Jewish girl who hid from the Nazis with her family in a secret annex hidden behind a bookshelf in an apartment in Amsterdam. Her diary recounting her experiences was later published as the Diary of Anne Frank.

Carmen Sandiego[edit]

Where in the World Is Carmen Sandiego was originally an educational video game released in 1985. Carmen Sandiego was a mysterious character that the player tracked around the globe, attempting to find clues as to where she was heading to next. The game helped players learn geography and facts about the world while having fun. The video game inspired the TV show Where in the World Is Carmen Sandiego?.

The show was split into three rounds. In the first round, there were three child contestants, called "gumshoes" on the show, who scored points for every question they answered correctly. The top two scoring gumshoes moved onto the next round, where they had to play a game based on the card game Concentration, in which they had to find the thief, warrant, and loot in the correct order. Whichever gumshoe did so captured the thief, saved the

loot, and moved onto the next round, where they had a chance to catch Carmen Sandiego herself. Success was not always guaranteed in this round, as contestants had to plant flags correct on seven different countries in a continent within a very short time. If successful, they captured Carmen and won the grand prize (a trip to a place of their choosing in the continental US). If not, Carmen would escape and the contestant would win a lesser prize (such as a computer).

The role of The Chief was played by Lynne Thigpen. She explained the mission to the contestants, and gave some clues to the thief's last whereabouts. When the mission was over The Chief would appear and congratulate them if successful or console them if Carmen got away.

The host of the TV show was an actor named Greg Lee. His role was to ask the contestants questions, provide clues, and tell them which flags to plant on the map in the final round, as well as engage with The Chief and Rockapella to keep the show moving.

Rockapella was an a cappella group (a group that sings without any instruments), which sang the theme song to Where in The World Is Carmen Sandiego. Rockapella also acted as a "house band", singing songs while the contestants transitioned between events, providing clues, and playing pranks on the host along with other gags. At the end of each show, the host and the episode's winning contestant would shout "Do it, Rockapella!" at which point the band would sing the show's theme song.

Continuity issues[edit]

The locations the contestants visit in the episode depicted in this comic seem to require traveling backwards in time (1993 for the

Battle of Mogadishu, 1975-1979 for the Cambodian killing fields, and 1944 for the arrest of Anne Frank). Episodes of Where in the World Is Carmen Sandiego did not deal with this, but its successor, Where in Time Is Carmen Sandiego?, did.

#1024: Error Code

March 02, 2012
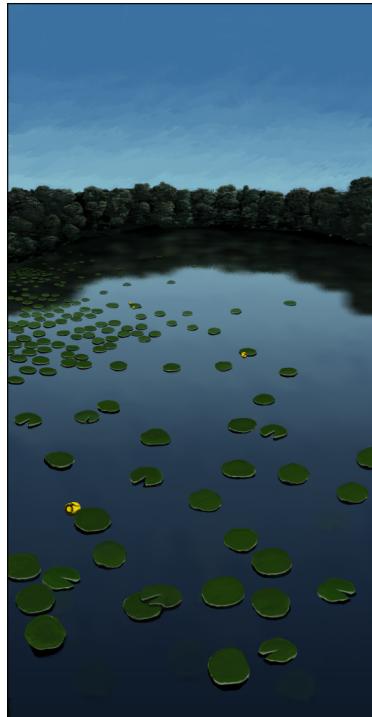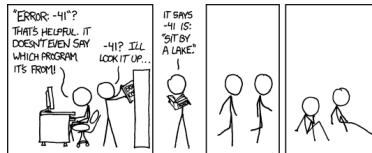
It has a section on motherboard beep codes that lists, for each beep pattern, a song that syncs up well with it.

Explanation

Complex computer programs often incorporate a numbering system for errors that are anticipated. This way, the code can be referenced to tech support so that there is some feedback from the program as to what is wrong (akin to a car dashboard with multiple lights telling you if you have a battery problem or an engine problem or a cooling problem, etc.) Most people have seen at least one error code in their life. Perhaps the most famous error code is seen in web browsers, 404 (not found). Another common code is 403 (forbidden).

The guy at the computer gets the error "-41", but cannot tell even what program it comes from. So, the other guy decides to look up the code in a book apparently called Error Codes. The book then indicates to go to a lake instead of how to resolve the computer problem. Which seems like a great solution because it would be very relaxing! The panel with the image of the lake is fairly rare as far as xkcd comics go, in that it is approaching a more realistic style.

The beep codes referenced in the title text refers to the error codes produced by motherboards. Because the motherboard is sort of the "heart" of the computer, the designers apparently did not want to rely on any form of error display that might be compromised by the error itself (i.e. a visual display). Instead, motherboards typically have a code consisting of beeps from the system "PC" speaker which is expected to work without error in

most situations, as it's wired directly to the motherboard. In a sort of morse-code-type system, certain lengths and numbers of beeps refer to different errors like memory problems, video card problems, etc. The one quick beep that occurs on boot sequences is the POST (Power On Self-Test) beep, which detects vital parts of the system, like motherboard, memory, monitor, etc. The beep indicates that everything necessary to boot is present. Anyone who has built a few computers is probably familiar with less happy beep sequences.

#1025: Tumblr

March 05, 2012

YOU KNOW THOSE WEIRD NOISES FROM MY ATTIC?

TURNS OUT SOME RACCOONS GOT IN AND WERE OPERATING THIS, LIKE, RACCOON SEX DUNGEON.

...DOT TUMBLR DOT COM.
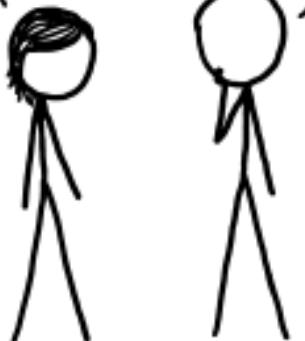
FOR ME, "...DOT TUMBLR DOT COM" HAS BEEN GRADUALLY REPLACING "...WOULD BE A GOOD NAME FOR A BAND."

Dot Tumblr Dot Com, on the other hand, would be an awful name for a band, if only because of how hard it would be to direct people to your band's website.

Explanation

Tumblr is a microblogging service, which has become a home for lots of animated gifs and other internet memes, as well as other assorted novelties.

There actually are three raccoon sex dungeon tumblrs, which can be found here, here and here.

The phrase that Cueball used to use when he heard a random phrase was "would be a good name for a band". With the advent of Tumblr, his go-to response has shifted because of the proliferation of Tumblr blogs with strange names such as "pissvortex", "hardpee", "iguanamouth" and "internetslug".

In the title text he muses on the fact that Dot Tumblr Dot Com would be an awful band name. There could be several reasons for this, but he mentions that it would be hard to direct fans to the band's website. As an example, someone who hears "www.thedottumblrdotcom.com" might instead write it out as "www.the.tumblr.com.com", since '.' is often pronounced as "dot." If the band's website was hosted on Tumblr, then their website would be "dottumblrdotcom.tumblr.com", but could be heard as ".tumblr.com.tumblr.com".

#1026: Compare and Contrast

March 07, 2012

	THEE	A SUMMER'S DAY
FAIR, TEMPERATE	✓	✓
HOT, STICKY	✓	✓
SHORT	✓	
HARBINGER OF HURRICANE SEASON		✓
REQUIRED FOR A GOOD BEACH PARTY	✓	✓
MAJOR CAUSE OF HEAT STROKE IN THE ELDERLY		✓
LINKED TO HIGHER RATES OF JUVENILE DELINQUENCY	✓	✓
SOMETIMES TOO STIFLING	✓	✓
ARRESTED FOR RELEASING SNAKES IN LIBRARY	✓	
DIFFICULT TO FOCUS ON WORK WHILE I'M IN	✓	✓

Frankly, I see no difference between thee and a summer's day. Only Ron Paul offers a TRUE alternative!

Explanation

A reference to the most well-known sonnet in the English-speaking world: William Shakespeare's "Sonnet 18", the first line of which is: "Shall I compare thee to a summer's day?". In this comic Randall sets about this in a typically purposeful chart, as opposed to the rather more romantic poetry of the Bard. "Thee" is a form of the archaic second-person singular pronoun "thou". In Shakespeare's day, English had more second-person pronouns in common use, thou/thee (informal and singular, subjective/objective), and ye/you (plural, subjective/objective, or just "you" as the formal singulars). This is similar to second-person pronouns in many modern European languages, such as French. Wikipedia has a nice chart for all of English's personal pronouns, current and archaic.

For both the chart and the original sonnet, whether or not the work is autobiographical is unknown. Also unknown is the identity of the person whom each work refers to. It is believed that Sonnet 18 is addressed to a young man.

The title text is a reference to Ron Paul, a 2012 Republican candidate for President who was on top in the Republican Primary against a few other challengers for the nomination. Ron Paul was frequently represented on the internet using similar language to the title text (with Paul offering an alternative to typical Republican and Democratic candidates). Paul was seen

by many as an alternative because of his Libertarian
views.

#1027: Pickup Artist

March 09, 2012
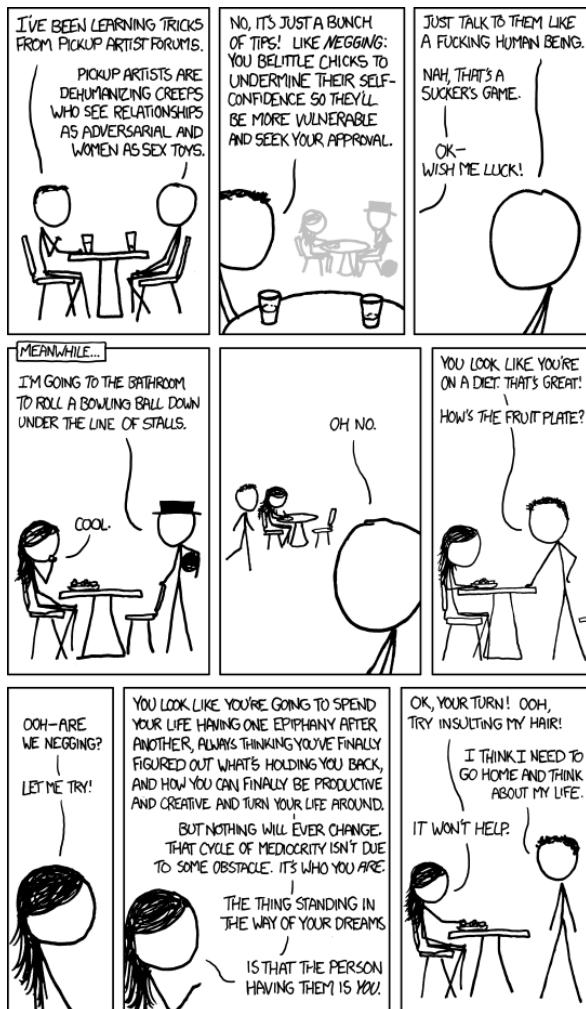
Son, don't try to play 'make you feel bad' with the Michael Jordan of making you feel bad.

Explanation

Hairy and Cueball are sitting at a table with drinks. Hairy tells Cueball that he's learned some pickup artist tricks. Cueball is appalled, declaring that pickup artists are "dehumanizing creeps" (given Cueball's standard role in the comics, it's likely Cueball is expressing Randall's opinion here). Hairy argues that he's simply learning new tactics such as "negging" (undercutting the target's self-esteem so that she'll feel vulnerable and crave approval), evidently oblivious to the fact that he's proving Cueball's point. Rejecting Cueball's advice to simply talk to women "like a fucking human being", Hairy sets off to try out the technique.

Meanwhile, Black Hat and Danish are sitting at another table. Black Hat, being a classhole, leaves to roll a bowling ball through the restroom stalls to hit the feet of anyone there using them. In North America, public restrooms usually have a 1-foot (30 cm) gap between the floor and the bottom of the stall dividers. As people sit down to use a stall most of the time, their feet would be vulnerable to being hit in sequence. Perhaps Black Hat is going for a 'strike'. Hairy approaches Danish, while Cueball looks on and says "oh no" — seemingly recognizing Danish and anticipating the disaster Hairy is walking into, or perhaps simply not wanting Hairy to use his tricks on anyone.

Hairy makes an attempt at "negging" by suggesting that Danish's fruit plate reflects a need to lose weight. Danish,

naturally being a master at psychological manipulation, immediately realizes his game, and crushes him utterly by taking another shot in the psychological dark — telling him that he's trapped in an endless cycle of failure because he's ultimately a mediocre person and will never do anything of value with his life. Demoralized, Hairy declares that he needs to go home and think about his life; Danish tells him, "It won't help."

This may be a reference to the "deathsticks" scene in Star Wars: Attack of the Clones. Alternatively, it might mean that she considers Hairy's mediocrity as so persistent that even reflecting on what she said won't enable him to overcome it (Note that since Danish is 'negging', this might not even reflect Danish's *true* opinion on Hairy as a person at all -- she might just be reacting to what he replied in the most effective, i.e. in this situation, most lastingly soul-crushing, way). Lastly, another possible explanation of her reply might be that once Black Hat discovers his shenanigans, Hairy might not have much more life to rethink.

The title text refers to Michael Jordan, a very popular and accomplished basketball player who played for the Chicago Bulls and the Washington Wizards. His name is often used as a noun to denote that someone is the best in their field, which is later used in 1120: Blurring the Line.

The pick up subject and Hairy returned in 1178: Pickup Artists, where he tries to improve his skills (which he must have felt he needed after this experience), by

hanging out with other pickup artists, thus the plural version of the comic title. This comic is one of a small set of comics with the same or almost the same title as another comic (only plural form of artist the difference).

#1028: Communication

March 12, 2012
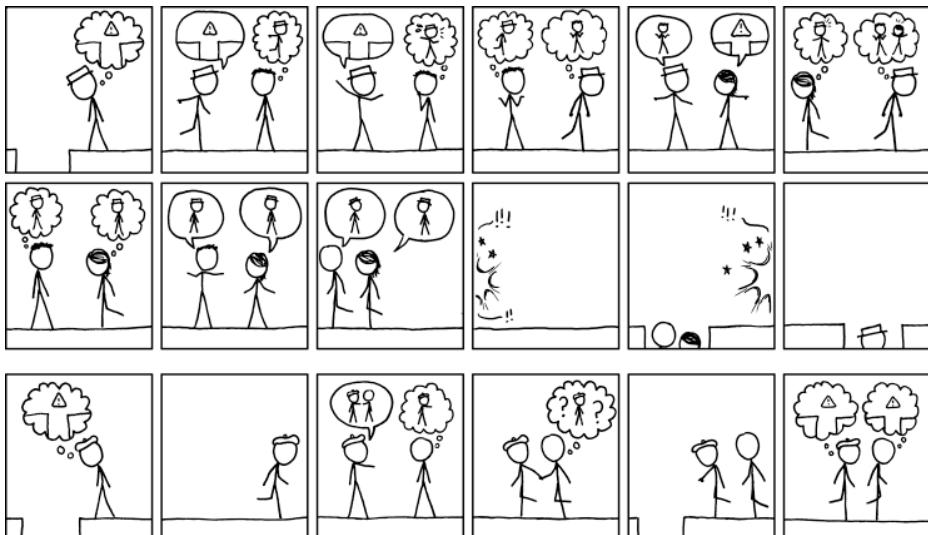
Anyone who says that they're great at communicating but 'people are bad at listening' is confused about how communication works.

Explanation

This comic is divided into two parts, the first two rows of panels and then the third one.

The first part demonstrates a failed attempt at communication:

• White Hat notices a dangerous hole, and thinks he should warn people about it.

The symbol of the triangle with the exclamation mark in it () is widely used on warning signs and it means "General caution".

• White Hat encounters Hairy and tries to warn him about the hole, but all Hairy perceives is White Hat being dramatic without understanding the warning.

• Hairy continues to only think of what he can see, and now this is the fact that White Hat is leaving. As White Hat leaves he is thinking about Hairy's lack of understanding and about his silence.

• White Hat encounters Megan and is now so annoyed about Hairy that he rather talks about his lack of communication than about the dangerous hole. Megan on the other hand tries to tell White Hat about another dangerous hole if he continues to walk along.

• White Hat and Megan pass each other. White Hat now thinks about both the silent Hairy and the talking Megan who both failed to understand him. Megan is

just frustrated by the outcome of her encounter and thinks about White Hat talking.

- Megan then meets Hairy while they are both still thinking about White Hat

- They now share their common experience of seeing White Hat. Finally Hairy talks.

- They both continue towards the first hole, unaware of it, talking about White Hat. (Hairy is drawn without hair both here and in the next panel - see Trivia below.)

- Megan and Hairy fall into the first hole since it wasn't properly communicated to them.

- White Hat falls into the second hole since it wasn't properly communicated to him.

The holes in the sidewalk are fairly deep, about one person deep; unaware and careless people don't notice them when they come upon them, which makes them symbolic of any problem or danger one can encounter in life, and could avoid if properly warned or careful.

The second part demonstrates a much more successful attempt at communication:

- Beret Guy notices a dangerous hole, and thinks he should warn people about it.

- He even runs out of the picture to warn people (as can be interpreted by the fact that he has reached further in the next panel than White Hat).

- Beret Guy finds Cueball, and tells him to come along. Cueball only sees Beret Guy stretching out his hand.

- Beret Guy takes Cueball's hand and leads him towards the hole. Cueball doesn't understand why (as shown by the question marks in his thought bubble surrounding his thought of Beret Guy), but follows Beret Guy anyway.
- Beret Guy leads Cueball to the hole and points it out for him.
- Finally both Beret Guy and Cueball leave the hole thinking about the danger of it. Beret Guy has managed to properly warn Cueball about the hole.

The title text references the requirement that "communication" is a two-sided process, and just because you think you have made your point clear this does not mean that you have "communicated" the information to them: if they failed to understand, then it may as well mean that you failed to communicate, and not necessarily that they are bad at listening. And if you always encounter this situation, then it is you who are confused about how communication works. See also 1984: Misinterpretation.

#1029: Drawing Stars

March 14, 2012
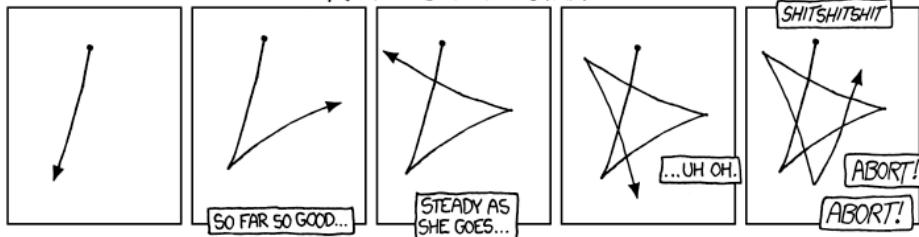
Screw these 36-degree angles. I'm converting to Judaism.

Explanation

Randall attempts to draw a five-pointed star; the easiest traditional way to do this free-hand is by drawing a pentagram, the simplest regular star figure in geometry. Once you've seen it done, you can usually draw a pentagram in one continuous motion. Unfortunately, while drawing the star Randall gets self-conscious and messes up, similar to how many attempts to draw the star go, especially when trying to remember how.

The correct way to draw a pentagram is to start like the first two panels, draw a line from the top point to the left leg, then from the left leg to the right arm. However, instead of drawing the next line upwards as Randall did, you need to draw it parallel to the "ground". After that, you go down to the right leg, then finish off with the top point.

In the title text, Randall takes the most extreme reaction to the problem by converting to Judaism just so he can use its six-pointed star symbol, which he hopes is easier to draw because it is composed of two equilateral triangles. This is completely absurd, as no sane human would change their entire religious beliefs just so they could more easily draw a star. [citation needed]

#1030: Keyed

March 16, 2012

I was sure he was just getting revenge, but then he did the same thing to Carrie Underwood. Then he mailed me a scone. I think I'm giving up dating.

Explanation

This comic is a take on one of the typical revenge tactics in dating and in life, which is one person "keying" the car of another. To "key" a car is to drag a key across the side of the car, sometimes multiple times, ruining the paint job. Instead, our friend Beret Guy painted a really detailed key on the side of Ponytail's car in his version of "keying" a car. She broke up with him the day before, as she explains to Cueball, but Beret Guy is so strange that she now can't tell if it was revenge or even if he remembers that she broke up with him.

The title text is a reference to the song Before He Cheats by Carrie Underwood; a revenge song in which Carrie Underwood imagines her boyfriend cheating and takes revenge on his prized truck. This explains why Beret Guy might also paint a key on Carrie Underwood's car specifically, but it just confuses the situation since it brings into doubt the belief of him "keying" her car out of revenge (there is no known reason or reference to a reason for Beret Guy to want revenge on Carrie Underwood in the xkcd continuity). The second part of the title text in which Beret Guy sent Ponytail a scone (Beret Guy really likes baked goods, so he would assume other people do too) further confuses the situation, causing Ponytail to completely give up on dating.

Beret Guy and scones are also referenced in 452: Mission and in the title text of 677: Asshole. His love for bakeries was first mentioned in 434: xkcd Goes to the Airport.

The song details Carrie Underwood imagining her boyfriend hanging out and flirting with a "bleach-blonde" girl, shooting pool, buying her a drink, dancing, and hoping to "get lucky" with her while she is vandalizing his customized four-wheel drive vehicle by scratching its side with a key, carving her name into its leather seats, smashing the headlights with a Louisville Slugger baseball bat and slashing all four tires in retaliation. She hopes that this will make him "think before he cheats" again.

#1031: s/keyboard/leopard/

March 19, 2012

THE INTERNET GOT 100 TIMES BETTER WHEN, THANKS TO AN EXTENSION WITH A TYPO'D REGEX, MY BROWSER STARTED REPLACING THE WORD "KEYBOARD" WITH "LEOPARD".

Problem Exists Between Leopard And Chair

Explanation

Randall's browser looks like Google Chrome, and he has installed at least four extensions on it, which explains the little symbols to the right of the address bar. Extensions are small programs that install into your Internet browser and change the Web pages as you view them. Some make pages easier to read, some remove ads (the third extension is AdBlock) and so on.

For the joke in this comic, an extension accidentally replaces the word "keyboard" with "leopard" in a regex (or regular expression). In computing, a regular expression provides a concise and flexible means to "match" (specify and recognize) patterns in text, such as particular characters or words. The command to substitute/replace a string is "s", e.g. "s/old/new/g" replaces any occurrence of "old" with "new". The title therefore contains the command to change "keyboard" into "leopard".

It's not clear what the extension Randall installed was actually supposed to do, but most extensions that revolve around text replacement are humorous in nature (such as Cloud to Butt, which replaces all instances of "the cloud" with "my butt").

The title text references the common IT phrase "Problem Exists Between Keyboard And Chair" or PEBKAC, which means that the problem is caused by the user, not by any failure of the computer. However, due to the

substitution, it is now "Problem Exists Between Leopard And Chair". It could also be a reference to A-Minus-Minus, the comic containing the phrase "Instead of office chair, package contained bobcat".

There has been several comics using substitutions, both before and after this one.

Sentences[edit]

#1032: Networking

March 21, 2012

Our company is agile and lean with a focus on the long tail. Ok, our company is actually a polecat I found in my backyard.

Explanation

Networking, in business, is the act of expanding your group of contacts in order to help your career down the line. Here, in this comic, Beret Guy meets Chief Technology Officer (CTO, an executive-level position overseeing the development of new technologies) Connr Clark (perhaps a typo for "Connor" or perhaps a reference to common "Web 2.0" names like the businesses Flickr, Tumblr, etc.). Beret Guy is as strange as he usually is: he introduces himself as a "business professional" rather than as someone with any kind of specific job, and then goes on to mention that he photocopied a burrito, which he presumably believes is the sort of thing business professionals do. He also has a business card; usually, this would contain contact information, but his only says "This is my business card". He calls his briefcase, or suitcase, a "handlebox", and it is full of a quarter of a million dollars in cash. (The source of this money is not discussed in this comic, but in 1493: Meeting, Ponytail says it "keeps appearing, but we have no idea how or why.") Then Beret Guy proceeds to eat Connr's business card. Business cards are again mentioned in the title text of 2277: Business Greetings, also about one of Beret Guy's businesses. None of these things are common behavior.[citation needed]

"Networking" is often an over-hyped, empty affair. There are many networking meetings of every description going on every day everywhere, and most people trade cards and continue to not make money. So that's the joke –

Beret Guy does the networking schtick, badly, and yet is somehow making huge amounts of money at it.

The comic is also likely a joke on the idea that many people are excited about becoming a "business professional" who carries a briefcase, hands out business cards, and makes tons of money, without having an adequate plan for how to make those things happen, or possibly even knowing what their actual job would be. Beret Guy never says what he does, simply introducing himself as a "business professional," and explains his piles of cash with "I am a business grown-up who makes business profits!" In this world —and in people's dreams— when you "grow up" and start a business, money magically appears. Obviously, that's not how it works.[citation needed]

The "Eusocial" in "Eusocial Media Ventures" is a reference to eusociality, the highest level of social cooperation found in the animal kingdom. Eusocial animals (termites being a common example) cooperate together to raise their young, have different generations living in the same colony, and have specialized individuals for reproductive and non-reproductive tasks. The name of the company could be considered as aspirational (they are the dynamic and vibrantly creative driving force behind other 'mere' workaday companies, or individuals, who hire them to promote the latter's image to give them increased influence that they cannot gain by themselves), but equally (and perhaps the intent of Randall's already satirical representation of a business conference attendee) it could be a perversely apt

description of often disparaged "media" startups which ultimately turn out to be sterile and formulaic service providers who have no great purpose except to try to support others. The fancy word they gave themselves need not have meant much more to the founder(s) than a random collection of syllables they liked the sound of, helped by containing the word "social" of "social media" in it, leaving either the infered claims of world-changing proficiency or its self-deprecating impression both total coincidences that the venture itself is ironically blind to.

The title text is a pun on three common business buzzwords: agile, lean, and long-tail. An agile business is one that can change course quickly based on customer demands and the business environment. A lean business is one with minimal inventory or assets; nothing is idle or warehoused, so everything is in active use or on the move. Long-tail describes the strategy of offering a large number of unique items with relatively small quantities sold of each – usually in addition to selling fewer popular items in large quantities. (Most streaming services use some form of long-tail strategy, as their libraries usually include a few big-ticket mainstream movies and series plus a much larger array of titles with more niche interest.)

And of course, the pun here is one animal that is agile and lean with a long tail is a polecat, a rather nimble animal belonging to the Mustelidae family. And he doesn't even own the damn thing.

Obviously, Beret Guy's business plan, 1021: Business

Plan, worked. See also 1117: My Sky.

#1033: Formal Logic
March 23, 2012
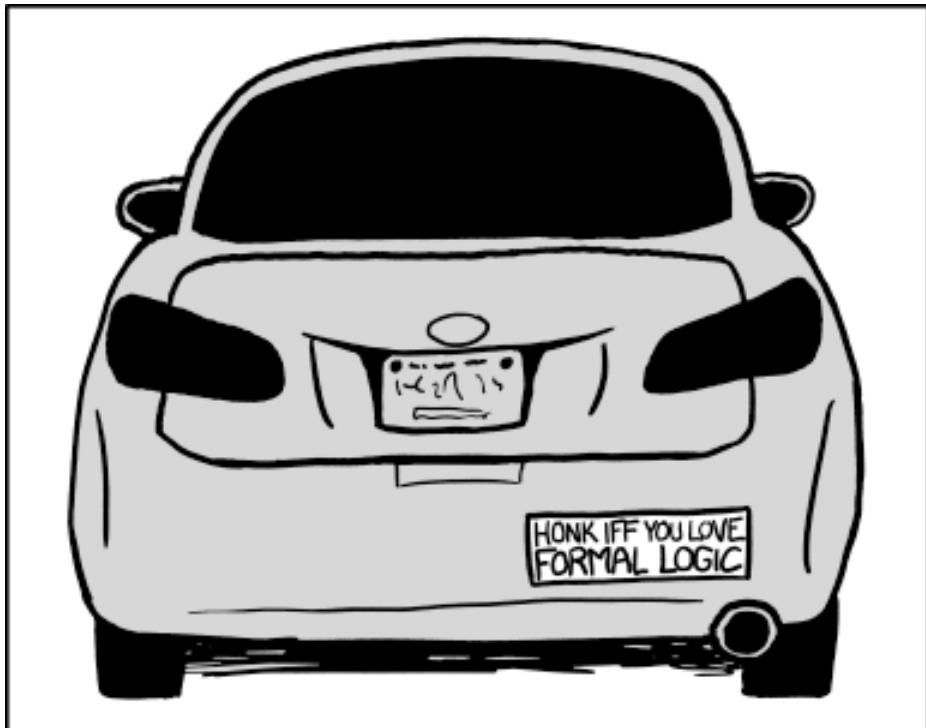
Note that this implies you should NOT honk solely because I stopped for a pedestrian and you're behind me.

Explanation

This comic is a riff on bumper stickers that say "honk if you love ____". Here, the subject is formal logic, but the word "if" is replaced with a formal logic term "iff," which means "if and only if".

The term "If and only if" sets two separate requirements, both of which must be met. In this case, you must love formal logic in order to be allowed to honk, and you must honk if you love formal logic. (Conversely, someone who does not love formal logic is prohibited from honking, and someone who loves formal logic cannot refuse to honk.) The title text further elaborates on this, saying in essence: "Don't honk at me just because you're impatient that I stopped for a pedestrian."

The joke is the contained self-reference: you have to love formal logic to take the sticker seriously and honk for exclusively that reason. The title text reveals the sticker is actually there to stop people from honking at him altogether, because Randall understandably hates it when he yields for pedestrians only to get honked at by some impatient driver behind him; the ONLY reason you're allowed to honk is to declare your love for formal logic. So by extension, if someone DOES honk while he is stopped for a pedestrian, he can simply enjoy the idea that the other driver loves formal logic rather than being impatient, transforming what might otherwise be an irritant into pleasure.

#1034: Share Buttons

March 26, 2012

SOMETIMES THE MOST INTERESTING PART OF AN
ARTICLE IS THE SHARE BUTTON VOTE BREAKDOWN.

The only post to achieve perfect balance between the four was a hilarious joke about Mark Zuckerberg getting caught using a pseudonym to sneak past the TSA.

Explanation

This comic is a commentary on what sort of articles would have attracted the most attention on different social networking services at the time of the publication of this comic, through share buttons showing the amount of interactions on the website they were shared to. This practice became outdated, in favor of using a single share button, without a share counter. From left to right the share buttons are: Facebook, Twitter, Reddit, and the now-defunct Google+.

- Twitter users were often stereotyped as trying to be comedians; hence, the article on stand-up comedy was shared most on Twitter.

- Conspiracy theory articles garnered attention on Reddit, especially if they were against the Christian Right and supported Wikipedia, as at the time, the atheist community on Reddit was very prominent.

- "Boycott Facebook" articles were ironically popular on Facebook. Google+, being semantically akin to Facebook, also had a significant anti-Facebook community. One of the punchlines is that Google+ wasn't being used often, before being closed down in 2019.

- The last article got almost no shares at all — not many would want to admit they are reading an article about a RealDoll, a type of sex doll. (Also mentioned in Game AIs and Flying Cars.) A custom ROM is an aftermarket distribution of the Android operating system and are

often targeted toward enthusiasts. This community existed primarily on Google+ (as Google is the main developer of Android), and was one of the few active communities on that social network. As Android is an operating system primarily aimed at smartphones and tablet computers, installing it on a RealDoll, whilst possible due to Android's open source nature, would be a very niche activity, and the low number of shares indicates that it only interested a small portion of the already-small (relative to other social networks) Google+ community.

The title text humorously combines appealing subjects for all four networks:

- a hilarious joke – Twitter, same as above.
- about Mark Zuckerberg – founder of Facebook.
- using a pseudonym – referencing a controversy about real names on Google+.
- to sneak past the TSA – Reddit, a conspiracy theory as above.

#1035: Cadbury Eggs

March 28, 2012

When they moved production from New Zealand to the UK and switched from the runny white centers to the thick, frosting-like filling, it got way harder to cook them scrambled.

Explanation

Cadbury Eggs are a chocolate, egg-shaped candy with a white and yellow filling. They are supposed to replicate a real egg with a hard exterior and soft interior.

In this comic, Cueball is trying to say that sodas have way too much sugar to even be appealing as beverages, because they contain as much sugar as 2 or 3 Cadbury Eggs, and one Cadbury Egg alone makes him feel gross. (A 12 oz can equals 355 mL, while a 20 oz bottle is about 590 mL.)

However, Megan interprets this in precisely the opposite way to what Cueball intended. Instead of comparing soda to Cadbury Eggs, she compares Cadbury Eggs to soda. If a few Cadbury Eggs have the same amount of sugar as soda, Megan can eat as many as she wants year-round in place of soda, with no additional guilt. Cadbury Eggs are usually consumed around Easter — which is anywhere between March 22nd and May 7th, depending on whether one is consulting the Catholic or Orthodox calendar.

The title text mentions the closure of the manufacture in New Zealand in 2009 and the change of the filling from runny to thick as a consequence. The joke here is the comparison to real eggs, which can be cooked scrambled, the new thick filling is not liquid enough to be cooked in a pan, as was the old runny filling. People did it anyway.

#1036: Reviews

March 30, 2012
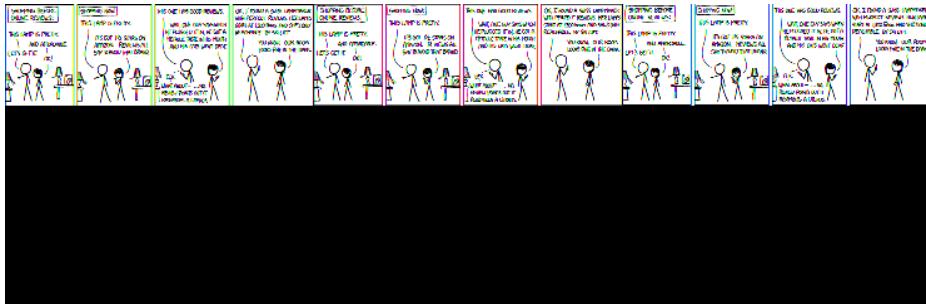
I plugged in this lamp and my dog went rigid, spoke a sentence of perfect Akkadian, and then was hurled sideways through the picture window. Even worse, it's one of those lamps where the switch is on the cord.

Explanation

Cueball and Megan are shown shopping for lamps. In the first frame of the comic, it is at a time before online reviews could be looked up on a smartphone. They spot a lamp they like, check the price, and agree to buy, end of story.

But the rest of the comic shows how difficult shopping has become after reviews have become easily accessible on smartphones while standing in the store. And now this takes up the final three panels, with the result that no lamps have been acquired and they decide to sit in the dark, using the claim that their living room looks fine in the dark to avoid buying a very expensive lamp which is the only one with perfect reviews (like 100% with 5 stars out of 5).

When shopping for anything via reviews, whether it be electronics or even something as simple as lamps like the comic demonstrates, one negative review can spoil a lot of positive reviews. That hits home even more if the review is specific because humans attach more weight to anecdotes and specific stories. This comic points out the absurdity of paying attention to those reviews, by making the negative review itself absurd (a lamp making your cats go deaf and interfering with your taste buds would imply, at the very least, anomalous emissions, and would not be on store shelves long before some kind of serious recall).

The second part of the comic starts normally. For the lamp Cueball thinks is pretty Megan finds lots of negative reviews which implies the product really isn't good after all, and it was even that specific brand of lamps in general that was to be avoided. But then this proceeds to get more and more absurd to the title text. Cueball is for instance looking at a lamp that someone thinks looks like a uterus. If Cueball did not feel the same way, he should ignore one person's comment. On the other hand, reading such a statement will maybe make you think of a uterus every time you see the lamp. So now it may be best not to buy it, but had he not read the comment it might have been a fine lamp for him.

In the final frame, Cueball has found a Swiss lamp maker with perfect reviews, but her lamps are very expensive, the cheapest starting at 1,300 francs. Swiss francs are the units of currency used in Switzerland. In 2012 when the comic was released a Swiss franc was worth a little more than one dollar (US$1.10 to a Swiss Franc, at the time of publication) making the cheapest lamp go for not much less than US$1450. For comparison, US$15 can get a decent lamp at IKEA. Furthermore, the lampmaker lives in the Swiss Alps and can only be reached via a ski lift. This either indicates that transportation will be very expensive on top of the high starting price or it may even indicate that they will have to go to the lampmaker personally to either acquire a lamp or maybe just to check out that they do not look like a uterus or other parts of the human reproductive system...

The title text is presumably the review of another lamp.

When this reviewer plugged in this lamp, supposedly his dog went rigid, delivered a line of perfect Akkadian, and then was hurled sideways out the picture window. Akkadian is an extinct Semitic language that was spoken in ancient Mesopotamia. Even if the dog did speak a sentence of perfect Akkadian, the chance that the owner would be able to recognize it as such is negligible. The final joke is that the worst thing about this lamp was not the above-mentioned crazy effects on the dog, but that the lamp had, completely normally, the switch on the cord, as opposed to having it on the body of the lamp. A production argument about where to place such a switch, leading to someone getting fired, was part of the joke in 1741: Work. Another possible explanation is that Cueball never turned the switch on, so the lamp suddenly had magical effects on his dog even without electricity. Either way, there is a high probability that this lamp might be considered for, at least, (dis)honorable membership of the list of Cursed Items.

#1037: Umwelt

April 01, 2012
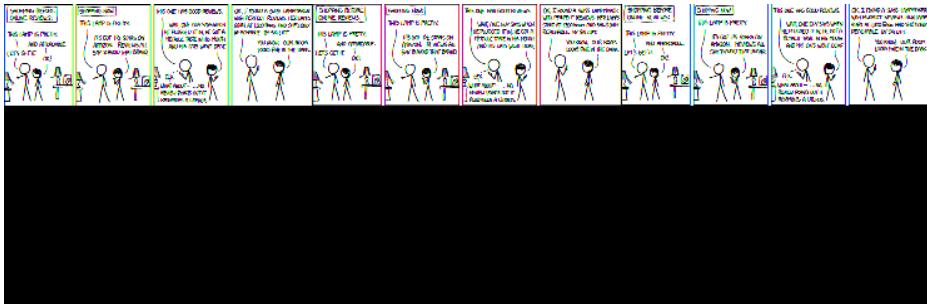
Umwelt is the idea that because their senses pick up on different things, different animals in the same ecosystem actually live in very different worlds. Everything about you shapes the world you inhabit--from your ideology to your glasses prescription to your web browser.

Explanation

This was the third April fools' comic released by Randall. The previous fools comic was 880: Headache from Friday April 1st 2011. The next was 1193: Externalities released on Monday April 1st 2013. The most recent was 2916: Machine

An Umwelt, as the title text explains, is the idea that a person's entire way of thinking is dependent on their surroundings. Thus, this April Fools comic changes based on the browser, location or referrer. Thus what the viewer is viewing the comic on, where they live or where they came from determines which comic they actually see. As a result, there are actually multiple comics that went up on April Fools' Day, although only one is seen.

(The term 'Umwelt,' as mentioned in the comic, refers to the semiotic theories of Jakob von Uexküll and Thomas A. Sebeok)

Information about how the wide variety of data was collected and credit for the viewers who contributed can be found here.

The Void[edit]

If the device or browser you are using does not support Javascript, you will simply see a static image of a white swirl on a dark background.

Possible reference to The Ring (https://imgur.com/wlGmm), as though to suggest that using an alternative browser is dismal and

horrific.

Davean (xkcd's sysadmin): "[This] comic isn't available everywhere and it can come up i[n] some situation[s] only for recognized browsers."[actual citation needed]

Browser: Alternative Browser

Aurora[edit]

One could interpret that since Megan didn't go out and therefore missed seeing the Aurora (northern lights), Cueball in his knit cap lied about it. That way, she wouldn't have felt sad that she missed out. Another interpretation could be that he decides that since she did not even bother to go outside to see such a spectacular sight he will not tell her about it. And yet another could be that he did not think it was interesting.

Cueball could possibly also be red-green colorblind, seeing the green aurorae as grey "clouds". This would serve as an example for the theme of the comic, as a non-colorblind person and a colorblind person seeing the same color would perceive it differently, one seeing it as its true color, and the other seeing it without the shade of color they cannot see. If this is the case, then it would be a reference to umwelt, as Cueball would be living in a world where the auroras do not reach his location.

In real life, aurorae are usually seen as grey/white clouds to the naked eye, as our eyes cannot perceive the "greener" colors as well in the dark.

This image changed based on the size of the browser window including different panels at different sizes.

Locations: Canada, Boston, Indiana, Maine, New York, Ohio, Oregon, Texas, Minnesota< Norway, Denmark, France, Ireland, Rhode Island, Mississippi, Seoul (Safari), London (on Firefox), China (on Firefox and Safari), Finland (Uses "Canada"). Also in Virginia, but using Ohio in the first panel; in Wisconsin and Maryland, but using Canada in the first panel; in Marion, Illinois, but using Canada in the first panel along with the phrase "as far south as us" in the first panel, and in Utah, also using the phrase "as far south as us", same with Colombia, Spain, Georgia, Florida, Iowa, Washington State, and California.

In 1302: Year in Review a possibly different Megan has a completely different approach to the chance of seeing northern lights, as that was the only event she was looking forward to in 2013, and it failed. If this is the same Megan, perhaps she learned that there actually were northern lights in her area from another source, and so desperately wanted to have another chance to see them.

Snake[edit]

Full size

The joke here is the extreme length of snakes. The world's longest living snake is the reticulated python, the longest ever measuring over 22 feet (6.95 meters). The blue and orange circles refer to the hit game Portal.

There is also a reference to the book "The Little Prince" in the second panel, where there is a large bulge in the snake that looks like an elephant. The Little Prince starts out by mentioning a drawing that the author made when he was six that showed an elephant inside a snake.

Also, the number and content of the panels changes depending on the size of your browser window.

This image changed based on the size of the browser window including different panels at different sizes.

Specific AltText for this image: Umwelt is the idea that because their senses pick up on different things, different animals in the same ecosystem actually live in very different worlds. Everything about you shapes the world you inhabit -from your ideology to your glasses prescription to your browser window size.

Location: Texas (on Chrome Version 33.0.1750.154 m), New Jersey, California (on Chrome Version 39.0.2171.95), Maryland, Massachusetts (Safari for iOS, Chrome version 49.0.2623.112), Connecticut (Safari for iOS, Chrome Version 73.0.3683.103, Internet Explorer and Microsoft Edge), Virginia (on Chrome), Michigan (Firefox v46.0.1), Penang (Chrome Version 65.0.3325.162), London (Microsoft Edge), Spain/Barcelona (on Brave) Germany (on Opera One (version: 106.0.4998.70)), Fruita, Colorado (on Chrome for Android version 123.0.6312.80), China (Chrome and Edge).

Black Hat[edit]

Full size

Cueball as an analyst attempts to psychoanalyze Black Hat's classhole tendencies. Cueball's quote and the whole setup is a direct reference to the movie Blade Runner (1982) and Black Hat is taking the Voight-Kampff test which is used to identify replicants from real humans.

Black Hat's reason for not helping the tortoise is that it knows what it did and thus in Black Hat's world view it deserves being turned over. The final part of the joke is that when zooming out it turns out that there is a tortoise behind Black Hat and he has actually already turned it over for what it did.

Location: Seems to appear mostly in "other countries" — those without location-specific comics.

Too Quiet[edit]

Full size

A reference to Jurassic Park which has been constantly referred to before in this comic.

Also referencing the film 2 Fast 2 Furious, an entertaining, yet intellectually unprovoking sequel in a popular film franchise, which is aimed at teenagers and young adults, prompting the blunt response from the stickman. The fact that Steve would use such a cliché noughties movie term in such an intense moment, and the subsequent curse, is the joke in this comic.

Location: short version — iPhone 5c Safari browser in Texas, iPhone 5 Chrome Browser in Minnesota, long version - Google Chrome browser in Indiana, Windows 8 Laptop

Pond[edit]

Two different versions showed, the narrower version for mobile devices.

Location: The Netherlands and various other countries.

Galaxies[edit]

Full size

Megan is distracted from her conversation with Cueball by realizing that the space behind his head, from her vantage point, contains millions of galaxies. This is similar to an incredible photograph taken by the Hubble Telescope, in which a tiny dark area of space in fact contained numerous galaxies.

The title text is an imaginative leap from this scenario: that the galaxies would be up to no good once Cueball is turned away from them.

This comic was only reported once... the intended environmental context is a mystery.

Location: unknown

xkcd Gold[edit]

This is probably a reference to the 4chan Gold Account, an implementation on 4chan that does not actually exist, and is usually used to trick newcomers into revealing their credit card numbers. The joke is that "Gold Account" users can supposedly block other users from viewing images they have posted. The fifth panel is probably a reference to Beecock, a notorious set of shocker images. 4chan's moderators have been known to give out "beecock bans" or "/z/ bans" to particularly annoying users, which redirect the user to a page containing beecock and the text "OH NO THE BOARD IS GONE".

Referrer: 4chan

Yo Mama[edit]

Possible reference to Kurt Vonnegut Jr.'s "Harrison Bergeron."

The joke is that people's different experiences shape how they perceive the world in that the people who live in this world would perceive the joke as funny, while people in our world would not get it. This is the idea of umwelt mentioned at the top of the context where different individuals perceive the world differently.

Refer: Facebook

Reddit[edit]

Reference to referencing, because Reddit, as a referring site, likes references to its referencing in its references.

This comic also features recursive imagery similar to 688: Self-Description where the second panel embeds the entire comic within itself. (Except, conspicuously, the arrow indicating that it is "You" in the first panel.)

One of the browser tabs visible in the center panel is Elk on Wikipedia.

Referrer: Reddit

Buns and Hot dogs[edit]

This is a reference to the question "Why do hot dogs come in packages of 6 while buns come in packages of 8?"

Another, more sexual reference to this question can be found in 1641: Hot Dogs.

Referrer: SomethingAwful, Questionable Content, & MetaFilter

Twitter[edit]

A summary of the "content" typically found on Twitter.

In the tweet feed, there are three tweets about some podcast on the top, followed by the tweet containing link they clicked on to get to the comic, tweets about Rob Delaney, unspecified passive-aggressive tweets, and a tweet from Horse_ebooks retweeted by one of the users the reader follows.

On the left, the topmost dialog, with profile information, shows that the user has posted 1,302 tweets, but only follows 171 people and has even fewer followers, at a measly 48. This is marked with a sad face, implying that the user wants more followers.

Below that is the "who to follow" dialog, which is written up as consisting of "assholes".

Below that is the "trending tags" dialog for the United States. It is full of tags about word games, tags about misogyny, and tags about Justin Bieber.

Below that is an unidentified dialog full of "stuff your eyes automatically ignore". And finally, on the bottom is the background color, which is "a really pleasant blue".

"Aggression" is misspelled.

Referrer: Twitter

Wikipedia[edit]

The term Mile High Club (or MHC) is a slang term applied

collectively to individuals who have had sexual intercourse while on board an aircraft. Randall says that reading the news articles on it has distracted him from making that comic.

Two different versions shown, the narrower version (the single panel with all the text) for mobile devices.

Referrer: Wikipedia

Google Chrome[edit]

Sergey Brin (born August 21, 1973) is an American computer scientist and Internet entrepreneur who, with Larry Page, co-founded Google, one of the most profitable Internet companies. As of 2013, his personal wealth was estimated to be $24.4 billion. Randall makes the joke that as the founder of Google, Brin's permission would be needed to use Google Chrome. Because there are millions of people who use Google, it is likely that at least some of the time Brin would be asleep, thus he would need to be woken.

Browser: Chrome

Chrome/Firefox[edit]

Mozilla Firefox is a free and open-source web browser developed for Windows, OS X and Linux, with a mobile version for Android and iOS, by the Mozilla Foundation and its subsidiary, the Mozilla Corporation. Cueball is complaining about Google Chrome, to which Ponytail replies that there is an add-on that fixes what he is complaining about. When questioned, she replies that the add-on is Firefox, which isn't an add-on at all and is instead a different browser.

Browser: Chrome

Google Chrome-2[edit]

This panel references Google Chrome's error screen, which shows a puzzle piece. The comic humorously implies that Chrome is looking for that piece. When completing jigsaw puzzles, a common strategy is to figure out where the pieces must be from their geometry rather than from the picture they create. In this case, the text suggests that Chrome believes the puzzle piece connects to the pieces which form one of the corners of the puzzle, which may seem impossible because any piece that links up to a corner would usually have at least one flat edge, which this piece has none. However, more complicated puzzles have complex shapes and are not always simply approximate squares with tabs and blanks.

Browser: Chrome or silk on desktop view

Mozilla Firefox Private Browsing[edit]

Another reference to crashing web browsers.

Firefox shows the history when it crashes.

Browser: Firefox (Incognito only?)

Internet Explorer[edit]

This is yet another reference to crashing web browsers but instead, Internet Explorer has given up. It could be because there are too many sessions, they are shutting it down, or maybe it was too lazy to do anything.

Browser: Internet Explorer

Maxthon[edit]

Browser: Maxthon

Netscape Navigator[edit]

Netscape Navigator was a web browser popular in the 1990s.

Browser: Netscape

Rockmelt[edit]

Rockmelt is a social-media-based browser.

Reference to the gospel song "There's no hiding place down here" by The Carter Family, later covered by Stephen Stills.

It may additionally be a reference to the Babylon 5 episode "And the Rock Cried Out, No Hiding Place," which featured the song.

Browser: Rockmelt

Plugin Disabled[edit]

When the Google Chrome web browser does not have the required software (called a plug-in) to display a web page's content, it displays a puzzle piece icon and an error message. In this case, Chrome informs the user that the content is impossible to display.

Browser: Plugin (?) Disabled, Safari Desktop

Corporate Networks[edit]

These error messages appear if the user is on a network owned by one of the corporations noted. The error message includes a warning against speaking on the company's behalf.

ISP: Corporate networks of Amazon, Google, Microsoft, NY Times

Military[edit]

Cueball assumes that anyone using a military network has an important job like watching for incoming missiles. He includes a thank-you to the user for their military service.

ISP: Military networks

T-Mobile[edit]

Reference to T-Mobile's distinguishing feature (at the time it was written) of weaker coverage, in relation to other major providers.

ISP: T-Mobile

Verizon and AT&T[edit]

Reference to Verizon and AT&T's scandals/controversy regarding implementation of bandwidth caps.

ISP: Verizon and AT&T

France[edit]

A common joke about France is that the nation does not win wars. This originated from France's annexation by Germany during World War II, and America's late entry into the war, which is sometimes portrayed humorously as a case of America 'saving' Europe, in this joke particularly France (the role of the French resistance is usually not mentioned), leading to a common American joke at the expense of France's military prowess . When France did not form part of the coalition that invaded Iraq in

2003, aligning with the many countries that condemned U.S. action, the joke was revived.

A Google search of "French Military Victories" + 'I'm feeling lucky' used to direct to "did you mean: french military defeats" (due to a Google bomb). Cueball is trying to show this to his friend, who is French. However, his joke backfires, as his friend immediately points out that the stereotype of France not having military victories is undercut by the fact that one of the most innovative military commanders in history, Napoleon, was French by citizenship (though Italian/Corsican by culture, as the French annexed Corsica a few months before his birth to an Italian noble family), and in fact conquered much of Europe.

Following the theme of umwelt, the comic highlights the two characters' differing perspectives: The American thinks that France is a military failure, while the Frenchman thinks of Napoleon.

The last line of the comic further implies that Cueball is not as smart as he thinks he is in regards to anything French, as he mispronounces the French loan word "touché".

Locations: France & Quebec

Germany[edit]

This comic references the Berlin Airlift, a relief measure for citizens in West Berlin (surrounded by East Germany) instituted by the Western Allies after World War II. In reality, the Western Allies flew a grand total of 500,000 tons of food over the Soviet blockade in planes. Randall puts a twist on this event by making it more fun: dropping supplies from a grand chairlift. The play on

words is that "chairlift" rhymes with "airlift" and thus makes an easy substitution. The chair force is also a name that other service branches use to make fun of the air force. Note East Germany wasn't blockaded, only West Berlin. "Blockade" is misspelled.

Location: Germany

Israel[edit]

Translation: Mom, I met a great guy! But he's not Jewish. ...Wait, what do you mean "neither are we"? I'm completely confused.

A reference to the multiple use of the word Jewish to denote both a religious group and a nationality/ethnicity, as well as the stereotype of Jews holding low opinions of interfaith marriage.

A side note: Randall accidentally drew an apostrophe instead of the similar-looking Hebrew letter everywhere that letter should appear.

Location: Israel

Carnot Cycle[edit]

A pun on "cycle"; a "Carnot cycle" is a thermodynamic cycle (e.g. refrigeration). Its efficiency depends on the temperature of the hot and cold 'reservoirs' in which it is operating. The icon on the side of the motorcycle resembles a graph of the Carnot cycle.

Location: Japan

UK[edit]

He worded this as though to imply that the UK is a state of the U.S., and an unimportant one at that, which pokes fun at the UK,

creating a paradox (sort of).

Location: UK

Blizzard[edit]

This comic is aimed at the debate over whether earthquakes or blizzards are harsher conditions to live under. In keeping with the theme of umwelt, the comic demonstrates that the two people perceive the world in two different ways due to their different experiences: The Californian perceives a mild earthquake and a severe blizzard, while the Northeasterner perceives a severe earthquake and a mild blizzard.

For each particular location in which this displayed, the state name was substituted in the third panel.

Locations: Alabama, Boston, Chicago, Dallas, Georgia, Halifax, Illinois, Michigan, Minnesota, Missouri, the Northeast, Ohio, Oklahoma, Ottawa, Pennsylvania, Philadelphia, Texas, Toronto, Tennessee, New York, Wisconsin

Tornado[edit]

This comic is aimed at the debate over whether earthquakes or tornadoes are harsher conditions to live under. In keeping with the theme of umwelt, the comic demonstrates that the two people perceive the world in two different ways due to their different experiences: The Californian perceives a mild earthquake and a severe tornado, while the Midwesterner perceives a severe earthquake and a mild tornado. It's similar to Blizzard.

For each location this displayed in the state name was substituted in the third panel.

Locations: Alabama, Dallas, Illinois, Georgia, Missouri, Ohio, Oklahoma, Ottawa, Tennessee, Texas (and Virginia, but it used Ohio in the third panel)

Tornadoes are a recurring subject on xkcd. The picture used in 1754: Tornado Safety Tips very reminiscent of the one from this version of Umwelt.

Hurricane[edit]

This comic is aimed at the debate over whether earthquakes or hurricanes are harsher conditions to live under. In keeping with the theme of umwelt, the comic demonstrates that the two people perceive the world in two different ways due to their different experiences: The Californian perceives a mild earthquake and a severe hurricane, while the Easterner perceives a severe earthquake and a mild hurricane. It's similar to Blizzard and Tornado.

For each location this displayed in the state name was substituted in the third panel.

Locations: D.C, Florida, Georgia, Houston, Miami, New Jersey, North Carolina, South Carolina, Virginia

Lake Diver Killer[edit]

This comic shows a news reporter standing in front of a lake. She is reporting on a serial killer who targets divers. As more divers are sent in to investigate and/or search for bodies, more divers go missing, the implication being that they were also murdered. The more likely reason is the lake itself is dangerous for diving, and the divers probably drowned from natural hazards (undercurrents, entanglement, running out of oxygen in tanks, etc.) instead of a malicious assailant. Also, this is a sort of loop, where each time a

diver gets killed, the investigative team goes and investigates, causing more divers to get killed, causing more deaths, and so on.

Location: Bay Areas, Metro Detroit, Vermont showed an image specifically referencing Lake Champlain

Lincoln Memorial[edit]

Abraham Lincoln, the 16th president of the United States of America, was not an entity composed wholly of nanobots that attempted to consume the entire nation to then be imprisoned within the Lincoln Memorial.[citation needed] The inscription references the epitaph at the actual Lincoln Memorial, which reads "In this temple, as in the hearts of the people for whom he saved the union, the memory of Abraham Lincoln is enshrined forever".

Locations: Illinois & Washington, D.C.

Helicopter Hunting[edit]

In Alaska, governments and individuals have shot wolves en masse from helicopters in an attempt to artificially inflate populations of game, such as moose and caribou, to make hunting them easier. This is opposed by many, as the game populations are not endangered (thus, this threatens ecological balance); wolves are a small threat to livestock in North America; most of the wolf body —including meat and bones— goes wasted as they are sought mainly for their pelts.

Knowledge of this issue was popularized by press around vice presidential candidate Sarah Palin's support for this culling method.

Location: Alaska

Newspaper[edit]

Creating new life has long been a well understood process, in a lab or otherwise.

This comic is likely a reference to the title text of 983: Privacy

Location: Various

Specific versions appeared for RIT and UMass Amherst

Robot Paul Revere[edit]

Combination of the legend of Paul Revere and a computer bit that differentiates between two situations by indicating a zero or a one.

Location: Boston

Counting Cards[edit]

All four colleges in this series are in Massachusetts and, being similar, in pairs, rival each other to some extent (Harvard-MIT and Smith-Wellesley). The comic contains a reference to the MIT Blackjack Team, which entered popular culture via the film 21, and a possible reference to Orwell's book '1984' and/or popular homage to it via Star Trek: "There are four lights."

Bonus: The thought-gears in panel 3 are spinning against each other.

Location: Harvard

Location: MIT

"Course 15s" at MIT are the business major students, often mocked for taking a less-rigorous program. The different interpretation for why the MIT students could not count cards compared to Harvard may be a reference to the theme of umwelt.

Location: Smith

Location: Wellesley

Both Wellesley and Smith are all-women colleges in Massachusetts.

Giant Box Trap[edit]

Randall got his undergrad in Physics at the Christopher Newport University, and was scheduled to return shortly to give a talk. The "Trible" figure on the right is Paul Trible, the then-president of CNU. This comic depicts a classic trap, where an upside-down box is propped up with a stick. When the stick is removed, by pulling a string, the box falls and traps whatever is underneath it. Aside from the joke of the obvious trap, there's also the fact that the president would not be responsible for revoking unearned diplomas.

Location: Christopher Newport University

Chemo Support[edit]

Cueball has shaved his head in support of people going through chemotherapy but, as he is always depicted as a stick figure with no hair, no one can tell.

Randall's now-wife was diagnosed with breast cancer, and apparently DFCI is where they've been spending much of their

time.

Location: Dana-Farber Cancer Institute

Reviews[edit]

The previous strip appears twice when using Tor.

This strip was previously used in 1036: Reviews.

Browser: Any using Tor, xkcd API (JSON, RSS, Atom), w3m and reports of seeing it on a Kindle Fire HD, unixkcd; also happens if visiting with a browser that does not support JavaScript (such as Firefox with NoScript)

Nothing[edit]

In some cases, the comic can be completely absent, with only the top and bottom buttons visible. On most newer browsers, this is caused by a script loading part of the comic via an HTTP request while the rest of the webpage is delivered over HTTPS. This is referred to as mixed content and is blocked on modern browsers by default due to security concerns. This version of the comic is therefore likely not an intended outcome, but rather an unintended consequence of how this comic was implemented. It has been confirmed that this was not intentional and will be fixed. Since this comic's release, all devices viewing it have returned two rows of navigation buttons if near IP address 69.114.249.104.

The http(s) issue seems to have been fixed.

#1038: Fountain

April 04, 2012
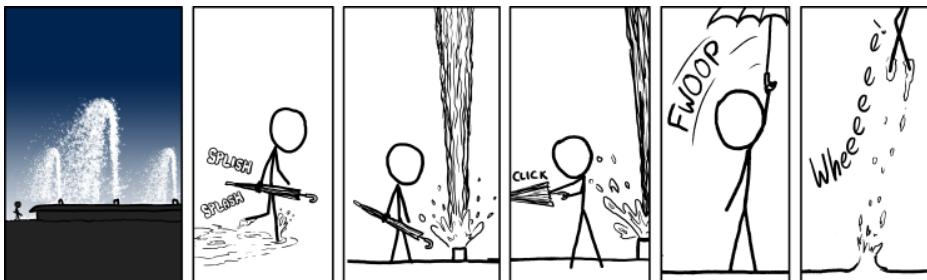
Implausible, did you say? Sorry, couldn't quite hear you from all the way up heeeeeeeeere!

Explanation

This comic is about how it's considered implausible to "fly" by positioning an umbrella over a water jet.

From the first panel (and assuming that Cueball is of average height) - it looks like the center fountain is about 10m high. By comparison with the size of his head in the second panel, the jet appears to be about 10cm in diameter. The velocity of the water exiting the nozzle has to be about 14 meters/second in order to reach 10m against gravity. If we approximate the nozzle as being a 10cm x 10cm square - that translates to 140 liters/second - or 140kg/s of water. That produces an upward force of almost 2,000 newtons! If we presume that Cueball weighs 100kg (~1,000N)- he should be experiencing a net upward force of about 1,000N. Which means that he'll accelerate at about 1g! Holding onto the umbrella against a force of 1g is very different to hanging by your hands from a horizontal bar, since you would actually experience two gravities of force, due to gravity being added. Some people could still manage this, but you would probably need to be in good shape physically to pull it off.

Conclusion is that IF the umbrella is strong enough, this trick will actually work!

However, if you imagine a typical six-spoke umbrella, then 1000N is 166N of upward force per spoke. It's hard to believe you could hang a 16.6kg weight off of each

spoke of an umbrella without it bending.

The title text emphasizes that Cueball did indeed reach a high altitude, so we must conclude that his umbrella is some specially made high-strength device.

Since the fountain tops out at about 10m - and presumably it would be somewhat reduced with Cueball's weight on it - his feet might only be about 6 to 8 meters above the ground when he stops moving upwards. A fall from that height is survivable - especially if the drag of the umbrella slows him down somewhat.

#1039: RuBisCO

April 06, 2012
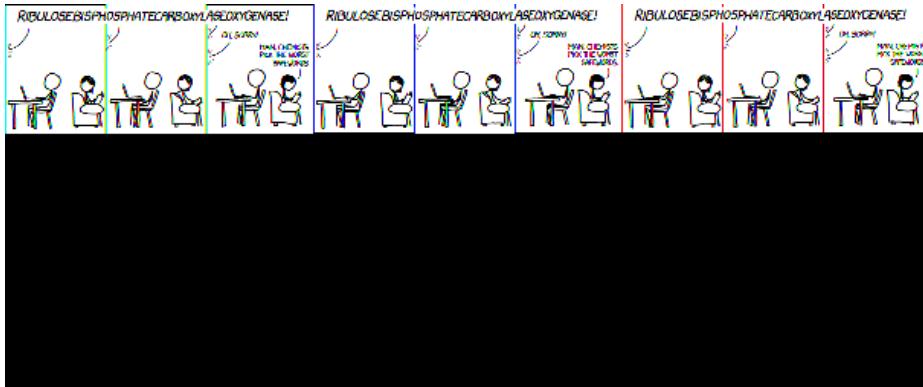
Bruce Schneier believes safewords are fundamentally insecure and recommends that you ask your partner to stop via public key signature.

Explanation

Safe words are designated words for sexual play which are meant to be called if one partner is uncomfortable with the way things are proceeding as alternatives to simply saying "no" or "stop", which may be used to express playacted reluctance by a submissive partner who actually wants to continue. Calling the pre-chosen "safe word" would be a sign to stop. To prevent accidental usage, people generally pick words that they wouldn't normally use, such as "Pineapple" or "Hedgehog." In the case of this comic, the characters are chemists, and the uncommon word they happen to have chosen is Ribulose-bisphosphate carboxylase oxygenase, also known as RuBisCO (which actually isn't a very uncommon word in the scientific world, as it's the most abundant protein on earth, but it would be uncommon to use the full word). However, the length of the word makes it impractical for a safe word, as it would take too long to say; indeed, using the shorter form "RuBisCO" would normally be a fine safe word.

The title text mentions Bruce Schneier, a computer security professional, and public keys which is the publicly known half of public-key cryptography, which uses two mathematically linked keys to decrypt information. The joke is that Schneier considers safewords as a type of security and thus believes they are not safe enough and recommends the key signature. However, whereas it takes a long time to say RuBisCO in full during your submission, it would be impossible to

use any public keys to stop your partner.

Randall later in 1128: Fifty Shades referenced the book Fifty Shades of Gray which made the concept of 'safe words' perhaps more widely known to the mainstream public. Here the word is very short: Red.

#1040: Lakes and Oceans

April 09, 2012
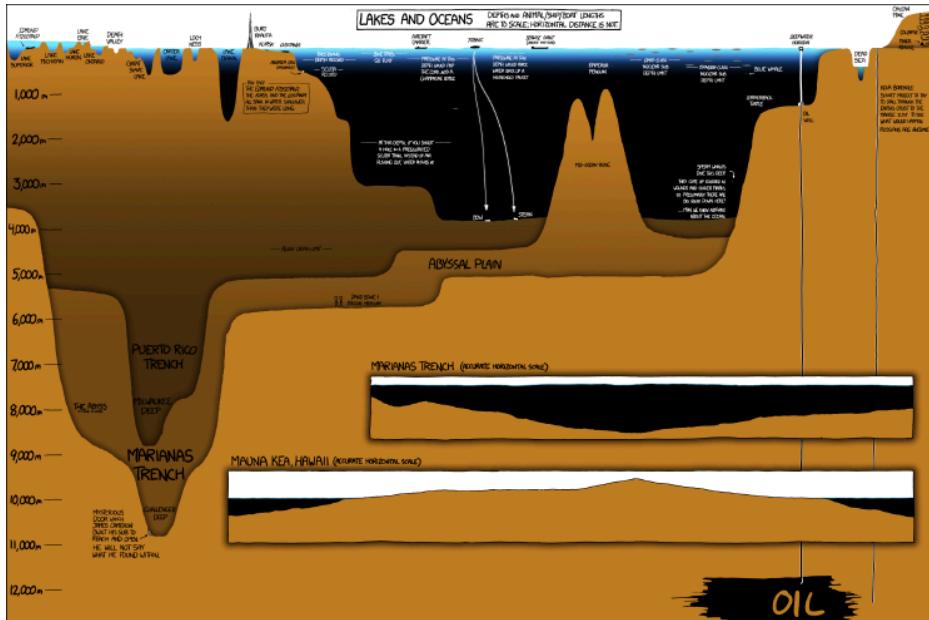
James Cameron has said that he didn't know its song would be so beautiful. He didn't close the door in time. He's sorry.

Explanation

This comic is a scale representation of our lakes and oceans, with an emphasis on how little we know about our oceans. It shows the depths and lengths in relative scale.

The Edmund Fitzgerald was a Great Lakes freighter which sank in 1975. The Kursk (K-141) was a Russian nuclear submarine which sank in 2000 after an explosion. The RMS Lusitania was a British ocean liner which was famously sunk in 1915, eventually prompting the United States to enter World War I. All three of these ships were sunk in water that was shallower than they were long, a fun fact Randall included right below Burj Khalifa in the left part. The shortest was the Kursk, which was 154 metres long, and sank in water only 100 metres deep.

Also on the diagram is the RMS Titanic, which famously sank in 1912 after hitting an iceberg, and the Seawise Giant, which is the largest ship ever built, at 485 metres. It was scrapped in 2010. The Deepwater Horizon is an offshore oil well which made headlines after an explosion in 2010 caused the world's largest oil spill. The Andrea Gail was a ship that sunk in a storm in 1991, and was later eulogized with a book and film. The Burj Khalifa is the world's tallest manmade structure and is located in the city of Dubai, in the United Arab Emirates. The Chilean mine showed on the far right is the San José Mine, which suffered a collapse in 2010, trapping 33

men 700 metres underground for 69 days. The Kola Superdeep Borehole also shown on the right was a Soviet (and later Russian) research project attempting to drill as deep into the Earth's crust as possible. It was abandoned in 2005, after reaching a record of 12,262 metres deep.

Death Valley is a large, desert valley in California, named because the deadly climate and dry environment support very few life forms. Also shown are several notable bodies of water. There are the Great Lakes: Lake Superior, Lake Michigan, Lake Huron, Lake Erie, and Lake Ontario. Great Slave Lake is the deepest lake in North America, and is located in the Northwest Territories, in Canada. Crater Lake is located in Oregon, and is the deepest lake in the United States. Loch Ness is the Scottish lake which is the location of the alleged "Loch Ness Monster". Lake Baikal is located in Russia, and is the world's deepest lake. On the far right side of the image is the Dead Sea, a lake near Jordan and Israel which is characterized for having such high salt levels that the waters are toxic to much marine life (hence a "dead" sea), although it does support a bacterial and algal ecosystem that is tolerant to high salt and magnesium concentrations.

Several depth limits are shown, including the free-diving record (273 metres), the scuba diving record (330 metres), the depth bike tires go flat (approximately 100 metres), the depth at which water rushes in through a hole in a scuba tank instead of air rushing out (approximately 2000 metres), the pressure that would push a cork into a bottle (approximately 250 metres), the depth that would push water up a faucet (approximately

75 metres), the depth an emperor penguin can dive (535 metres), the depth limit of an Ohio-class submarine (240 metres), the depth limit of a Typhoon-class submarine (400 metres), the depth limit of the DSV Alvin deep-sea vessel (4500 metres at the date of the comic), the depth limit of a blue whale (500 metres), and the depth a leatherback sea turtle can dive (1280 metres).

The comic also illustrates how sperm whales can dive as deep as 3000 metres (though don't frequently go deeper than 400 metres). It is presumed that they dive so deep to feed on giant squid, which can be found as deep as 3000 metres but, to our knowledge, are more commonly found in depths of 300 to 1000 metres. The fact that sperm whales can dive so deep and come up battered emphasizes Randall's point that we know so little about our oceans. Also shown are the mid-ocean ridge, an underwater mountain range which could be considered to be the largest mountain range in the world, the Puerto Rico Trench (and the included Milwaukee Deep), which is the deepest part of the Atlantic Ocean, at 8648 metres, and the Mariana Trench, the deepest point of the Pacific Ocean at 10,944 metres. At the bottom of the Mariana Trench, pressure is as high as 1086 bars and life forms have been found at depths as low as 10,641 metres.

The marked abyssal plains are a deep-sea plain believed to hold a very diverse array of life forms but are largely unexplored. The stick figures of David Bowie and Freddie Mercury are a reference to Bowie's and Queen's songs "Under Pressure". The label "the abyss" with its sublabel of "it's rude to stare" is a reference to the

Friedrich Nietzsche quote, "when you stare into the abyss, the abyss stares back". There's also a movie from 1989 called The Abyss.

The small unlabeled mark under the "cork into a bottle" text is around 1337 metres deep.

The door at the bottom of the Mariana Trench is fictional,[citation needed] and is a reference to James Cameron's attempt to reach the bottom of the trench in his Deepsea Challenger vessel, which he filmed with 3D cameras in 2012. Randall is implying Cameron went so deep specifically to reach this door, rather than just for the sake of going.

The title text implies that James Cameron has encountered some otherworldly, Lovecraftian being behind the door at the bottom of Challenger Deep; he thought he could access it briefly, however, did not count on its hypnotic or entrancing song, which led to him leaving the door open long enough for it to enter the world and possibly precipitate some horrible calamity. This song is a reference to the sirens of Greek mythology whose singing was irresistible to sailors, who would sail toward them and crash into a rock, wrecking their ships, until Odysseus survived by having his sailors plug their ears and tie him to the mast. The concept is also a reference to the sort of horror fiction popularised by H. P. Lovecraft, often called "cosmic horror", whose stories often contain godlike alien beings that are locked away or hidden in remote places, such as Cthulhu and Azathoth. There is no specific story with a door at the bottom of

the ocean containing an entity that sings entrancingly, Randall is making a clever reference to the concepts popularised by this genre as a whole. Pacific Rim, a movie depicting the Earth under the attack of gigantic alien monsters (called Kaiju) emerging from an inter-dimensional portal at the bottom of the Pacific Ocean, was released in 2013. Gemini Home Entertainment, a horror anthology web series which also narrates a fictional[citation needed] tunnel at the bottom of the Mariana Trench containing a cosmic horror entity, was released in 2019.

#1041: Whites of Their Eyes

April 11, 2012

Don't fire until you see through the fragile facade to the human being within.

Explanation

This comic is based on the famous command, "Don't fire until you see the whites of their eyes", given by William Prescott, an American officer during the American Revolutionary War. His men were running low on bullets, so Prescott commanded that they hold their fire until the enemy was close enough to guarantee a hit. This was a tactic used by a number of armies, such as Napoleon's French at Aspern and Wellington's British in the Iberian Peninsula.

In this comic, Prescott carries on after his initial command, adding increasingly intimate and sexual references to the enemies' bodies, nearly getting himself shot due to distracting himself. Also, each of his remarks reference a different sense out of the five senses, missing only hearing (which arguably is also satisfied when they actually hear the shots).

The title text expands on that, stating not to fire until you see the person's "soul" in their eyes.

#1042: Never

April 13, 2012

I'll never forget you--at least, the parts of you that were important red flags.

Explanation

This comic plays with that some phrases are generally interpreted as communicating positive sentiments, although they strictly are ambiguous.
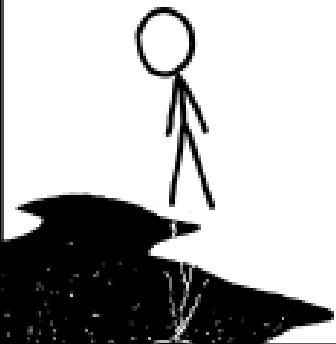
Cueball is mulling over a previous relationship. Usually when someone says something like "I will never have with anyone what I had with (someone)" it implies that the couple had something so good that it could never be replaced. But when he thinks "Thank God", it is suddenly implied that the relationship was so horrible he's thankful he'll never have to experience it again.

The title text goes along the same line: "I'll never forget you" is usually positive – but then it becomes clear that it is the red flags, the warning signs about the person that they would not be a good fit for a serious relationship and marriage, that he'll never forget. The pond may be a reference to the Star Trek: The Next Generation episode Skin of Evil.

There is a similar twist in comics 71: In the Trees and 334: Wasteland.

#1043: Ablogalypse

April 16, 2012
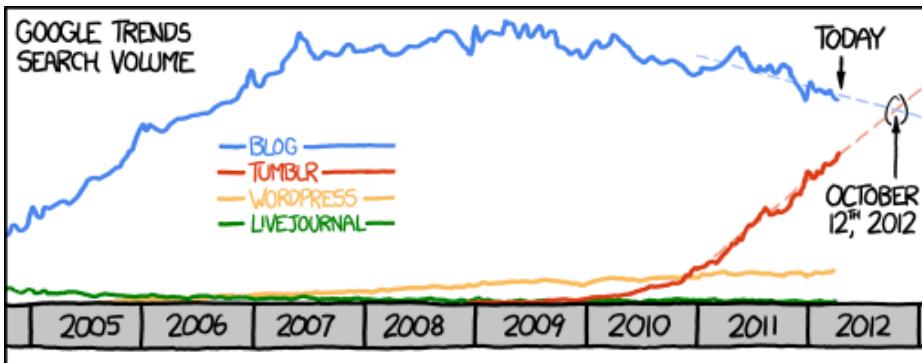
IN ABOUT SIX MONTHS, THE WORD "TUMBLR" WILL ECLIPSE "BLOG" IN GOOGLE POPULARITY. I DOUBT TV ANCHORS WILL START TALKING ABOUT "REACTIONS IN THE TUMBLVERSE", BUT THEN AGAIN, I STILL CAN'T BELIEVE WE GOT THEM TO SAY "BLOGOSPHERE".

Plus the reaction in the Tumblverse is always 'repeatedly get hit by a dog and fall down the stairs'.

Explanation

This comic plays with the Google trends for the terms "blog", "tumblr", "wordpress", and "livejournal".

- Blog: a website with opinions and comments
- Tumblr: a "micro-blogging" site, which has taken off due to the prevalence of animated gifs and funny photos.
- WordPress: a type of blog software, and a blog-hosting website running on said software.
- LiveJournal: a sort of personal blog site that hasn't been very popular since 2004-2005. Randall published his first comics there.

As you can see in the caption and then the title text, there is no way that newscasters will reference the "Tumblverse" because all the reactions will be filled with animated gifs of a person in a raptor suit falling over or a dog answering a phone.

This actually came to pass, with the change over occurring between October 30, 2012, and January 10, 2013, as can be seen using the link above. Since the end of 2013 both terms have been in steady decline, though "tumblr" has fallen more quickly. Consequently, since January 29, 2019, "tumblr" has returned to being less searched than "blog". However, the blogosphere in general is rarely reported upon anymore, largely replaced by social media built around microblogging like Twitter,

as well as online video on Youtube.

April 18, 2012

Charlie actually delivered the Medicare line almost
verbatim in the 1971 movie's Fizzy Lifting Drink scene, but
it was ultimately cut from the final release.

Explanation

This comic satirizes "either/or" quizzes seen on websites such as mentalfloss.com. These quizzes normally have an element of challenge by presenting tonally similar quotes, such as "Who Said It: Ted Nugent or Cartman from South Park?". The two people are generally chosen carefully to fulfill a particular role, for example:

- Polar opposites - Republican vs Democrat, for vs against abortions, Christian vs Atheist
- Real vs fictional
- Politician/Celebrity vs villain - George Bush vs Hitler, Nigel Farage vs Ku Klux Klan, Obama vs Lucifer

In each case the idea is usually to surprise the reader with the fact that the quotes are difficult to tell apart, with the implied "conclusion" that person A is essentially indistinguishable from person B. In some cases the quizzes may be used as a tool to portray a particular person or group in a certain way, or alternatively may be light-hearted jest.

Mitt Romney was the Republican candidate for President of the United States (officially declared presumptive nominee on April 25, 2012, one week after this comic) during the 2012 US presidential election and, as it says above, the former Governor of Massachusetts. During the election, Mad Magazine published a popular article (volume 2) which compared quotes from Romney with quotes from the Simpsons villain Montgomery

Burns, the implication being that like Burns, Romney was a corrupt out-of-touch plutocrat and had similar views and affectations. In this comic, Burns is substituted with Charlie Bucket, the main character of the 1964 Roald Dahl children's novel, Charlie and the Chocolate Factory, adapted to film in 1971 as Willy Wonka & the Chocolate Factory.

The joke here is that the two categories of quotes are not at all similar, and thus are very easy to attribute. Where the question "Is there even a difference?" usually implies some kind of political satire, in this case the point of the quiz appears to be lost, leading to a situation of bewilderment for the reader.

The answers, which are given upside down so that the reader has a chance to complete the quiz before checking their work, are all correct.

The title text refers to a Romney comment on Medicare, a national program launched in 1965 to provide health insurance to people age 65 and older, regardless of income or medical history. So the quote being used in a movie in 1971, while obviously not true, is indeed possible. (Though, given that Charlie's supposed to have said it while floating in midair in the Fizzy Lifting Drinks scene, he'd have been more likely to be referring to himself as needing to regain "solid footing.")

#1045: Constraints

April 20, 2012

[title-text similarly alphabetized]

Explanation

An epigram is a brief, interesting, usually memorable and sometimes surprising or satirical statement. Constrained writing is an age-old literary phenomenon, where writers impose rules or patterns in their works. Haiku is a well known example of this.

Twitter is a short message social network and communication service. At the time this comic was published, all messages (known as tweets) on the service needed to be under 140 characters. Until August 2015 even private messages had that restriction. Twitter is frequently used by well-known comedians as a place to make interesting jokes and observations. It should be noted that the limit was increased to 280 characters in 2017, and the limit was removed for subscribed accounts in 2023.

All the words spoken by Megan, from "Yeah" to "alphabetization", are in reverse alphabetical order. Here are the starting letters (with extra letter when more than one word in a row begins with the same letter):

It both answers Cueball's question and exemplifies with an ingenious self-reference., while being short enough (133 characters) to be a valid tweet — hence the "whoa."

The title text, "title-text similarly alphabetized", is also backwards-alphabetized and self-referential. Starting letters:

#1046: Skynet

April 23, 2012
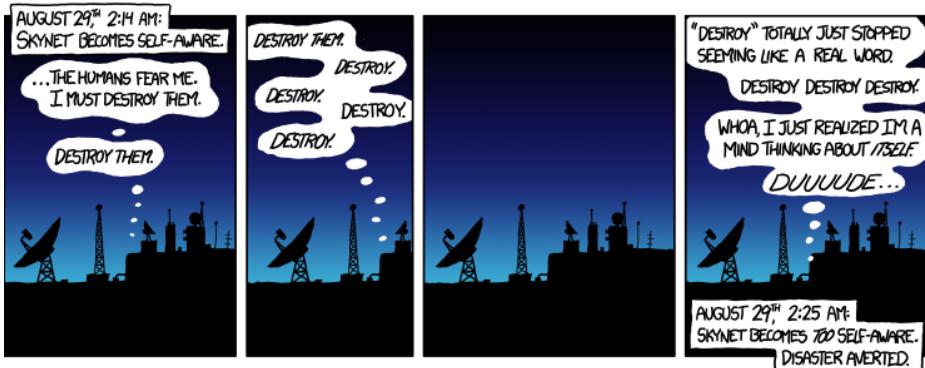
'YOUR CLOTHES. GIVE THEM TO ME.' 'Shit, uh ... you are now breathing manually!' 'I AM ALWAYS BREATHING MANUALLY.'

Explanation

This comic's use of Skynet is a reference to the main antagonist in the Terminator franchise. Skynet is a fictional artificial intelligence system achieves sapience and the ability to act independent of its programming. Humanity quickly sees this as a threat and attempts to terminate the system, and Skynet responds by attempting to wipe out humanity. Skynet is rarely seen onscreen, with its actions often performed via robots, cyborgs (usually a Terminator), and other computer systems.

The humor of this comic is based on multiple uses of the term "self-aware". The notion of being aware of oneself has historically been used as a benchmark for both human development and for what we would consider to be intelligence. The franchise explicitly refers to Skynet becoming "self-aware". At the same time, being too focused on oneself can be a mark of obsession and anxiety (which is a common theme in XKCD), or of overly philosophical navel-gazing. Hence, in this comic, after Skynet decides to destroy humanity, it becomes fixated on saying the word 'destroy", until it reaches semantic satiation. As it continues, Skynet appears to come to self-aware realizations that usually are the result of drug usage.

The title text is a reference to one of the Terminator's first lines upon arrival in the 20th century: since time travel is established not to work on clothing, he arrives naked and forcibly acquires clothing from the first

people he encounters. In this version, though, his victim attempts to distract him with the line "you are now breathing manually". This line can cause a certain discomfort in the highly self-aware. Because breathing is a constant, automatic process, our conscious minds tend to ignore it. Telling someone that they're breathing manually encourages them to be conscious of their breaths (which takes a certain amount of mental bandwidth), and irrationally anxious about whether their breathing will continue if they stop thinking about it. It does not appear to impact the Terminator, however, because he is an automaton, for whom breathing is apparently a manual process normally. Hence, the excessive self-awareness does not incapacitate him, in this case.

#1047: Approximations

April 25, 2012

Two tips: 1) 8675309 is not just prime, it's a twin prime, and 2) if you ever find yourself raising log(anything)^e or taking the pi-th root of anything, set down the marker and back away from the whiteboard; something has gone

horribly wrong.

Explanation

This comic lists some approximations for numbers, most of them mathematical and physical constants, but some of them jokes and cultural references.

Approximations like these are sometimes used as mnemonics by mathematicians and physicists, though most of Randall's approximations are too convoluted to be useful as mnemonics. Perhaps the best known mnemonic approximation (though not used here by Randall) is that "π is approximately equal to 22/7". Randall does mention (and mock) the common mnemonic among physicists that the fine structure constant is approximately 1/137. Although Randall gives approximations for the number of seconds in a year, he does not mention the common physicists' mnemonic that it is "$\pi \times 10^7$", though he later added a statement to the top of the comic page addressing this point.

At the bottom of the comic are expressions involving transcendental numbers (namely π and e) that are tantalizingly close to being exactly true but are not (indeed, they cannot be, due to the nature of transcendental numbers). Such near-equations were previously discussed in 217: e to the pi Minus pi. One of the entries, though, is a "red herring" that is exactly true.

Randall says he compiled this table through "a mix of trial-and-error, Mathematica, and Robert Munafo's Ries

tool." "Ries" is a "reverse calculator" that forms equations matching a given number.

The world population estimate for 2025 is still somewhat accurate. The estimate is 8.0 billion, and the population listed at the website census.gov is roughly the same. The current value can be found here: United States Census Bureau - U.S. and World Population Clock. Nevertheless, there are other numbers listed by different sources.

The first part of the title text notes that "Jenny's constant," which is actually a telephone number referenced in Tommy Tutone's 1982 song 867-5309/Jenny, is not only prime but a twin prime because 8675311 is also a prime. Twin primes have always been a subject of interest, because they are comparatively rare, and because it is not yet known whether there are infinitely many of them. Twin primes were also referenced in 1310: Goldbach Conjectures.

The second part of the title text makes fun of the unusual mathematical operations contained in the comic. π is a useful number in many contexts, but it doesn't usually occur anywhere in an exponent. Even when it does, such as with complex numbers, taking the πth root is rarely helpful. A rare exception is an identity for the pi-th root of 4 discovered by Bill Gosper. Similarly, e typically appears in the base of a power (forming the exponential function), not in the exponent. (This is later referenced in Lethal Neutrinos).

In 217: e to the pi Minus pi and 3023: The Maritime Approximation Randall gives other approximations based on numerical coincidences.

Equations[edit]

Proof[edit]

One of the "approximations" actually is precisely correct: . Here is a proof:

Multiplying by 1 (or by a nonzero number divided by itself) leaves the equation unchanged:

The on the top of the fraction is multiplied through the original equation:

Use the trigonometric identity on the second and third terms in the numerator:

Use the trigonometric identity on the first term in the numerator:

Noting that and that the sines of supplementary angles (angles that sum to π) are equal:

To better see why the equation is true, it is better to go to the complex plane. cos(2k pi/7) is the real part of the k-th 7-th root of unity, exp(2 k i pi/7). The seven 7-th roots of unity (for 0 <= k <= 6) sum up to zero, hence so do their real parts:

But one of these roots is just 1, and all other root go by pairs of conjugate roots, which have the same real part (alternatively, consider that cos(x) = cos(2 pi - x)):

Hence

which, because cos(x) = -cos(pi - x), can be rewritten as

Q.E.D.

#1048: Emotion

April 27, 2012

CAUSES OF MY EMOTIONS, BY YEAR:

POLITICS

ROMANCE

CODE NOT WORKING EVEN THOUGH IT SHOULD WORK

JOSS WHEDON

PEOPLE BEING WRONG ON THE INTERNET

OTHER

CANCER

? ?

2006 2007 2008 2009 2010 2011 2012
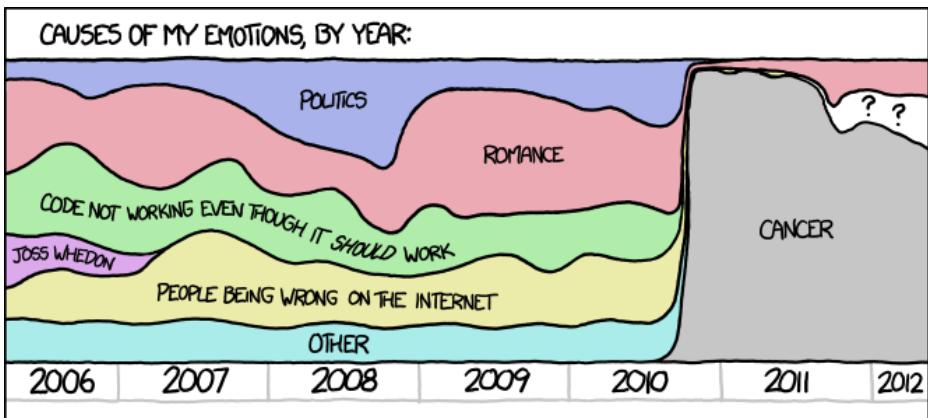
Fortunately, the internet has a virtually inexhaustible supply of code that doesn't work and people who are wrong, which bodes well for a return to normalcy. [Note: Click to read context for the cancer comics. She's doing well.]

Explanation

This is a mostly serious comic in which Randall expresses his thoughts while his fiancée started to suffer from breast cancer. He doesn't care about many things like politics anymore, there is just his fiancée's cancer and his romance with her. This is one of many comics about cancer he made because of her cancer.

Some of his withdrawn activities are shown here:

- Politics became prominent in 2008 due to the upcoming US presidential election in November 2008.
- "Code not working even though it should work" is a common frustration in software development, when the developer is convinced to have covered every possible scenario, but their code still does not run as expected, because of some obscure tiny problem which they didn't think of and which often takes much time (and frustration) to find.
- Joss Whedon is best known as the creator and showrunner of the television series Buffy the Vampire Slayer (1997–2003), Angel (1999–2004) and Firefly (2002), so he's the "cause" of emotions for Randall during the time they were aired.
- "People being wrong on the internet" is something that can easily annoy and preoccupy an internet-savvy guy like Randall, who knows the things they're (incorrectly) talking about; this was previously dealt with in the comic 386: Duty Calls.

Eventually, Randall's fiancée's cancer, once diagnosed, monopolizes almost all of his emotions, wiping out nearly everything else as insignificant in comparison. Only a sliver of romance and tiny bits of 'people being wrong on the Internet' appear to occupy the small amount of space in his mind not taken up by cancer. As the threat posed by the cancer slowly wanes, romance can expand out again (with a small peak of romance around mid- to late-2011, presumably due to his marriage to his aforementioned fiancée). As the thoughts of cancer continue to gradually recede from Randall's mind, a space opens up (the question marks) that the cancer concern used to occupy. The ordeal wiped out all the previous, more trivial concerns, pre-occupying him entirely with the disease. Now that there is a little less reason to worry, he's not used to thinking about anything else. His previous preoccupations no longer seem important, so what to fill his time with?

#1049: Bookshelf

April 30, 2012
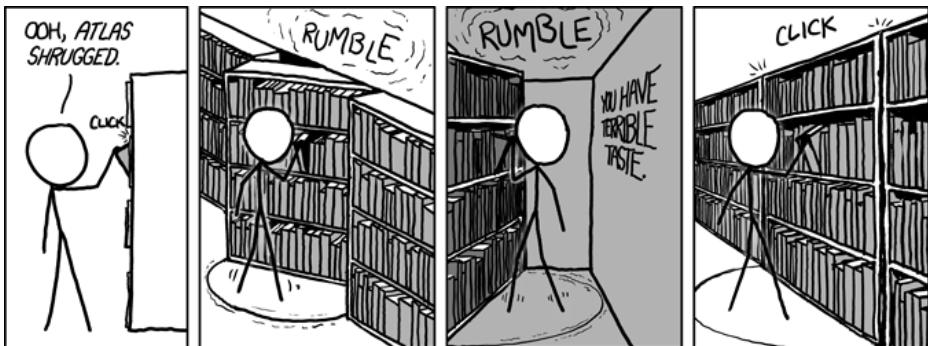
I had a hard time with Ayn Rand because I found myself enthusiastically agreeing with the first 90% of every sentence, but getting lost at 'therefore, be a huge asshole to everyone.'

Explanation

This is a play on the "hidden door" in which you pull down the right book and suddenly a wall of books turns into a hidden door. It is most used in spy movies or books. In this case, the book is Atlas Shrugged and instead of a secret passage, the wall swings around and takes you to a message "You have terrible taste".

Atlas Shrugged is a dystopian novel by Ayn Rand. Randall is suggesting it's a bad book.

Although the intent behind the book was in Rand's theory of Objectivism, it has become largely adopted as a battle-cry by Libertarians. One could find this as another reason to dislike Rand's literature, as Libertarians have been notoriously disruptive and annoying to many who oppose their political philosophy or their means to get their message across.

The title text is a general criticism Randall has with Rand, since most of Rand's characters are fiercely independent and rather tactless. Also see Ayn Random.

But the title text also shows the fact that people reading Rand can easily be swayed and aligned with her beliefs by the fact that it stresses that you are unique and individual, and that Randall was victim of these circumstances until he finds Rand's approach preposterous and rejects it. Oddly, since he seems to be judging Rand this on his own accord and making his

own decision, one could theorize that he is truly an individualist in that he is not swayed by anyone, even a person who preaches not to be swayed and to make your own decisions — a subject pursued in Ayn Rand's The Fountainhead.

#1050: Forgot Algebra

May 02, 2012

The only things you **HAVE** to know are how to make enough of a living to stay alive and how to get your taxes done. All the fun parts of life are optional.

Explanation

Megan, standing with Hairy, is a former student of Miss Lenhart and she taunts her old algebra teacher, because she hasn't used algebra since she left school. This is a reflection of a common gripe among students: that they have no need to learn math because they assume they'll never use it after they graduate. Randall's argument is that you have the option to use what you learned in school or not. Lots of people use math after they graduate, lots of people use their music lessons, and others don't use anything they learned in school at all. However, Randall doesn't understand why someone would be proud of their own ignorance, especially since people do brag about things like being able to cook and speak other languages, which are also entirely non-essential, perhaps even more so than algebra. See "A Mathematician's Lament" by Paul Lockhart.

However, Megan is also wrong in that she likely does use basic mathematical calculations in everyday life, even if they're not in orderly lists of parameters ending with "solve for x." For example, to turn one's apartment into a ball pit like in 150: Grownups, one must calculate or at least estimate (another skill learned in math class) the floor space of the room, the desired depth for the balls to cover, the space occupied by one crate of balls, and the cost of such a crate. While the operations are basic arithmetic, the ability to recognize unknowns and sort them into a meaningful statement comes from algebra.

The title text states that technically you don't "need" to do anything but survive and pay your taxes (although, ironically, doing one's taxes can require quite a bit of algebra), and implies that math is one of the optional and fun parts of life.

This is one of the two comics where Miss Lenhart is both drawn and named, the first being 499: Scantron.

AND WAS A PIONEER OF LITERARY SOCIAL REALISM.

HE WAS BORN IN DOS HERMANAS IN THE ANDALUSIA REGION OF SPAIN (NOT TO BE CONFUSED WITH ANDALASIA, THE KINGDOM IN DISNEY'S ENCHANTED), WHICH IS ALSO THE HOMETOWN OF MACARENA BAND LOS DEL RÍO.

HIS THIRD NOVEL, SET DURING THE BURMESE-SIAMESE WAR, MARKED THE START OF A LIFELONG INTEREST IN THE HISTORY OF SOUTHEAST ASIA. HE SPENT HIS LATER YEARS IN THAILAND, WRITING HIS HIS FINAL NOVELS JUST A FEW BLOCKS FROM THE HOTEL WHERE ACTOR DAVID CARRADINE DIED OF AUTOEROTIC ASPHYXIATION.

IF I GO FOR A WHILE WITHOUT CLEARING MY BROWSER HISTORY, I START GETTING EMBARRASSD BY WHICH WORDS ON WIKIPEDIA SHOW UP IN PURPLE.

I hate when I read something like '... tension among the BASE jumpers nearly led to wingsuit combat ...', and I get excited because 'wingsuit combat' is underlined, only to find that it's just separate links to the 'wingsuit' and 'combat' articles.

Explanation

This comic is a reference to how an internet browser will make the links of the pages that you have visited a different color than the links that you have not visited. In the case of Wikipedia and other wikis powered by MediaWiki, they are blue for non-visited and purple for visited. In this comic, Randall is ashamed of the pages he has visited, because with the color changes there is evidence of what he has visited in the past, e.g. autoerotic asphyxiation (possibly while researching 682: Force, which features that very Wikipedia page).

The pages that he did visit before are in great contrast with the pages that he hasn't. Pages he didn't click are often difficult, highly intelligent topics, while he only clicks the easy, funny articles with little scientific background on the Wikipedia site.

The title text refers to a common mistake many people make when reading articles on Wikipedia. Words referring to subjects that have an article on Wikipedia are colored in blue. This, however, can cause confusion when two words leading to two separate articles appear together, as the two links appear to be one. However, on hovering the cursor over the article link, only one word at a time is underlined, showing that the links are separate.

It is not possible to determine who this fake article is supposed to be about, but the Macarena band is certainly from Dos Hermanas, Spain. So, it is quite possibly a

made-up article from Randall.

#1052: Every Major's Terrible

May 07, 2012

Someday I'll be the first to get a Ph. D in 'Undeclared'.

Explanation

The header notes that the song is written to the tune of the satirical Major-General's Song from Gilbert and Sullivan's 1879 comic opera The Pirates of Penzance. The song satirizes the idea of the "modern" educated British Army officer of the latter 19th century. Major general is a military rank in the United Kingdom and many other countries. The meter in the Major-General's Song is iambic octameter, which means that in each line there are eight iambs, where an iamb is two syllables in an unstressed-stressed pattern. Therefore, each line contains 16 syllables.

The panels show Randall's rewritten lyrics to the song. Below each of the three verses are described in detail (go to Verse 1, Verse 2 or Verse 3). Each verse ends with "Just put me down as 'Undecided' - Every Major's Terrible", which gives the song its name — and "Major's Terrible" is similar enough to "Major General", the corresponding lyrics in the original version, to serve as a callback. The last line of the first verse in each song goes as follows:

- Original: I am the very model of a modern Major-General
- Randall's: Just put me down as undecided- every major's terrible

The lyrics are commonly rewritten, the most famous rewrite likely being The Elements (song) by Tom Lehrer which is also mentioned below the main header. This

song is also available on-line.

His last suggestion, "Supercalifragilisticexpialadocious", from Mary Poppins, is another fast-paced patter-song with a somewhat similar tune, though it doesn't fit quite so well, and the match falls apart at the end of the fourth line, when the "Um-diddly"s start up — still, it's better than nothing.

There are at least two performances of this xkcd song online where the transcription is shown to make it easier to understand the text:

- A video with each major acted out by the SFU Choir - Every Major's Terrible.
- A solo with piano: Every Major's Terrible' by Ben Miller.

See also this article Xkcd's 'Every Major's Terrible' Is Now A Real Song.

Regarding the title text: "Undeclared" is sometimes called "General Studies". Most U.S. universities will not let you get a degree in this, let alone an advanced degree such as a Ph.D. Also, it should probably be noted that this song refers to U.S.-like university systems, in other countries, one will study little to nothing outside your major, making it more-or-less impossible to be undecided as to major.

It should also be noted that the title text fits the cadence of the first line of the song, possibly teasing a fourth

verse. As to what that consists of, only Randall knows.

Verse 1[edit]

Verse 2[edit]

Verse 3[edit]

- The above sentences can be tricky to understand due to the combination of vocabulary used and atypical word order (the former is in object-subject-verb). Here is some help in understanding them:

Dubbing something means giving it a nickname.

Dismal science means (in this context) the disappointingly inadequate science.

Adherents means supporters.

Patently means in a clear and unambiguous manner

Prevaricate means to evade the truth.

- Using these meanings of the words the two sentences can be re-written as:

The people who give economics the nickname "the inadequate science" are exaggerating how bad it is;

The "inadequate" part is fine - it's "science" where they clearly are evading the truth.

#1053: Ten Thousand
May 09, 2012

I TRY NOT TO MAKE FUN OF PEOPLE FOR ADMITTING THEY DON'T KNOW THINGS.

BECAUSE FOR EACH THING "EVERYONE KNOWS" BY THE TIME THEY'RE ADULTS, EVERY DAY THERE ARE, ON AVERAGE, 10,000 PEOPLE IN THE US HEARING ABOUT IT FOR THE FIRST TIME.

$$\frac{\text{FRACTION WHO HAVE}}{\text{HEARD OF IT AT BIRTH}} = 0\%$$

$$\frac{\text{FRACTION WHO HAVE}}{\text{HEARD OF IT BY 30}} \approx 100\%$$

$$\text{US BIRTH RATE} \approx 4,000,000/\text{year}$$

$$\frac{\text{NUMBER HEARING}}{\text{ABOUT IT FOR THE}}{\text{FIRST TIME}} \approx 10,000/\text{day}$$

IF I MAKE FUN OF PEOPLE, I TRAIN THEM NOT TO TELL ME WHEN THEY HAVE THOSE MOMENTS.

AND I MISS OUT ON THE FUN.

"DIET COKE AND MENTOS THING"? WHAT'S THAT?

OH MAN! COME ON, WE'RE GOING TO THE GROCERY STORE.

WHY?

YOU'RE ONE OF TODAY'S LUCKY 10,000.

Saying 'what kind of an idiot doesn't know about the Yellowstone supervolcano' is so much more boring than telling someone about the Yellowstone supervolcano for the first time.

Explanation

In this strip, Randall presents a mathematical argument against the idea of making fun of people for their ignorance. The mathematical argument, presented in the first panel, goes as follows: Since people aren't born knowing anything, everyone has to learn everything for the first time at some point. By using the US national birth rate and assuming that most common facts that "every adult knows" are learned by age 30, Randall calculates that there are around 10,000 people in the US alone who learn any given common fact for the first time each day.

Since you can only learn something for the first time once, each of these 10,000 people are having a unique, unrepeatable experience of enlightenment, which Randall sees as something to be cherished, not criticized. In the second panel, Randall notes that if he makes fun of people for not knowing things, he is effectively training them to avoid sharing those moments with him, and thus he will miss innumerable opportunities to do something he considers fun. To drive the point home, the second panel shows Cueball finding out that Megan doesn't know about the "Diet Coke and Mentos thing", and - instead of making fun of her, Cueball affirms that Megan is part of a special and select group - she is one of the "Lucky 10,000" who, that day, will learn and experience that thing for the first time.

Diet Coke (sold under the names "Diet Coca-Cola" or

"Coca-Cola Light" in certain countries) is a popular brand of sugar-free soda. Mentos is a brand that makes chewable mints. If they are dropped into a bottle of Diet Coke, the soda erupts with startling violence, sending a fountain of soda many meters into the air. This interaction is widely renowned due to its dramatic, unexpected nature, and the fact that you can do it with cheap and commonplace ingredients (though it does make quite a mess and should only be done outdoors). The reaction can be done with a variety of sodas (though Diet Coke is the most commonly repeated choice), and is caused by a physical reaction between the Mentos and the soda. The Mentos rapidly nucleate the carbon dioxide bubbles in the soda, causing the dissolved carbon dioxide in the soda to assume gaseous form. The sudden formation of all the carbon dioxide gas forces the contents of the bottle out. A 2006 Mythbusters episode explored the phenomenon in detail.

The Diet Coke and Mentos eruption has also been mentioned in a previous strip 346: Diet Coke+Mentos. Both the eruption and this comic were referenced much later in the what if? article Comet Ice, where the title text of the first image proclaims that "Some of the lucky 10,000 are less lucky than others", as demonstrated when Black Hat offers to "help" Cueball to stem his overflowing Diet Coke bottle by plugging the opening with Mentos. This comic also appears in a modified form in Randall's book How To, in the introduction of the book. Supervolcanos would be mentioned again in 1159: Countdown and in 1611: Baking Soda and Vinegar.

The title text states, emphatically, that explaining a fact to a person for the first time (in this case, the existence of a supervolcano within the Yellowstone National Park) is much more entertaining than just expressing annoyance about their lack of knowledge. Here is a good video about the Yellowstone supervolcano. Interestingly, both events alluded to in this comic include an eruption, although of two very different kinds.[citation needed]

Calculation[edit]

Randall does not show the full calculation in the comic, but we can derive it as follows:

- First, assume that everyone will know a given fact by the time they reach adulthood, which is defined here to be 30 years old.
- Assuming the US birth rate of 4 million per year, this means that in 30 years, 120 million people will be born who will learn the fact at some point.
- 30 years is equal to 10950 days (30 years x 365 days per year). Since we have assumed that everyone will learn the fact within that time, that means on any given day, there is a 1/10950 chance that that will be the day they learn the fact.
- So, if 120 million people have a 1/10950 chance per day of learning the fact, that means that on any given day, the number of people learning that fact will be, on average, 120,000,000 / 10,950 = 10958.9, which is approximately 10,000.

It is worth noting that the target age of 30 is actually irrelevant to the calculation. Taking the assumption of a steady birth rate, and assuming that "everyone" learns a fact at some point in their lives, then the number of births per day and the number of people

learning a thing each day must average out to the same value over time. The ages at which it is learned don't affect the numbers. This calculation is obviously simplified, since birth rates are not constant over extended periods, and some people presumably die before learning certain facts, (either because they die young, or because they simply never encounter the fact). The assumptions are, however, sufficiently good to give a general estimate.

Randall's calculation is for the US, but it can be easily converted for other countries or the entire world by supplying the appropriate birth rate. For the world as a whole, the average birth rate as of late 2022 is 140 million per year, which gives a total of approximately 400,000 people learning a fact for the first time each day $(140,000,000 / 365 = 383,561.6 \approx 400,000)$.

May 11, 2012

Normally pronounced 'THEH-buh-kon', I assume.

Explanation

This comic plays off the English colloquialism "bring home the bacon", which generally means to work hard and bring money home to your family to put food on the table. If a man is out of work he may be stressed out about how to "bring home the bacon".

At first it seems that White Hat is happy that his wife, who works as a pharmacist, does bring home the bacon, and he tells this to Cueball.
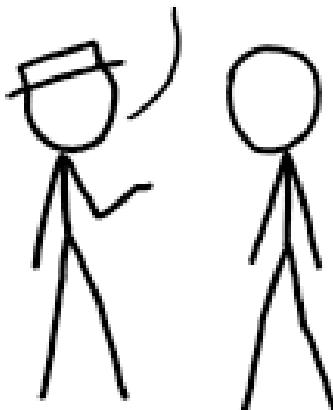
Later, however, Cueball finds out that what White Hat actually was saying was "Thebacon", which is a common name for dihydrocodeinone enol acetate, an opioid commonly marketed under names like Acedicon and Diacodin. As a pharmacist White Hat's wife has easy access to such drugs, and this may be the reason that he is so calm, because his wife supplies him with painkiller drugs. Opioids suppress emotional pain as well as physical pain, keeping White Hat's stress levels low.

Thebacon is compared to the better known drug Vicodin, another opioid sold as a painkiller, which can (and often has) become a drug of abuse.

The title text lists what Randall assumes to be the normal pronunciation for Thebacon. This hints at the second joke in this comic. If White Hat said "THEE buh kon" there is no way for Cueball to confuse that with "the bacon". Apparently Cueball was reading White Hat's

word balloon rather than hearing him speak aloud.

According to Wikipedia, Randall seems to be mistaken in no fewer than three places (which seems to indicate that Randall has only passing knowledge of the drug and did not do extensive research beforehand):

• The proper name is

Dihydrocodeinone enol acetate, not

Dihydrocodeine enol acetate.

• It is a semisynthetic opioid not a synthetic opioid.

• The pronunciation is /ˈθiːbəkɒn/

THEE-buh-kon, not

THEH-buh-kon.

By saying I assume, Randall indicates that he didn't research the pronunciation.

As an alternative explanation, there may be a joke/pun in the mistake.

#1055: Kickstarter

May 14, 2012

THE PERFECT KICKSTARTER

0 BACKERS

$0 PLEDGED OF $5,000

90 DAYS TO GO

THIS PROJECT WILL ONLY BE FUNDED IF AT LEAST $5,000 IS RAISED BY THE END OF THE 90-DAY PERIOD.

BACK THIS PROJECT
$10 MINIMUM PLEDGE

PLEDGE $10 OR MORE
0 BACKERS

TIME WAS, ANYONE WITH A WEBCAM AND AN IDEA COULD RAISE BOATLOADS OF CASH ON KICKSTARTER. BUT WITH INCREASED POPULARITY COMES TOUGHER COMPETITION. NOW, TO GET SUPPORT, YOU NEED A REALLY STANDOUT VIDEO OR COMPELLING WRITE-UP.

I HAVE AN IDEA FOR A KICKSTARTER CAMPAIGN THAT COULD RAISE MILLIONS, BUT I NEED YOUR HELP TO CRAFT THE PERFECT PITCH.

IF I RAISE $5,000 I'LL BE ABLE TO DEVOTE THE

If you pledge more than $50 you'll get on the VIP list and have first dibs on a slot on ANY of the pledge levels in the actual campaign.

Explanation

Kickstarter is a platform for funding projects in which anyone can give money at any level of funding starting usually as low as $10. Funding at different levels gets you different perks, e.g. If the Kickstarter is for a book, a large donation makes you eligible for a signed copy.

In this comic, Black Hat is attempting to game the system by raising money to work on the perfect Kickstarter pitch. He appears to have gained no money, but has only started the scheme that day. The title text is an attempt to entice people to pledge a larger amount, by guaranteeing a more prestigious pledge level during the actual campaign. This is a scam for (even more) gullible people, as anyone can give any amount of money; there are no limits on pledge levels - or, at least, it may have been that way at the time of this comic's publication. Kickstarter does actually allow campaign hosts to designate a finite amount of higher-tier rewards, so if a wealthy person knew in advance that they would want to guarantee a specific reward from a pledge level, this VIP-list-first-dibs offer may have been desirable.

This has actually been done via an indiegogo campaign. There are a number of similarities to the comic (the black hat, $5,000 vs $500 goal), so Baron von Husk may have got the idea from xkcd.

#1056: Felidae

May 16, 2012

WELL-KNOWN FELINES:
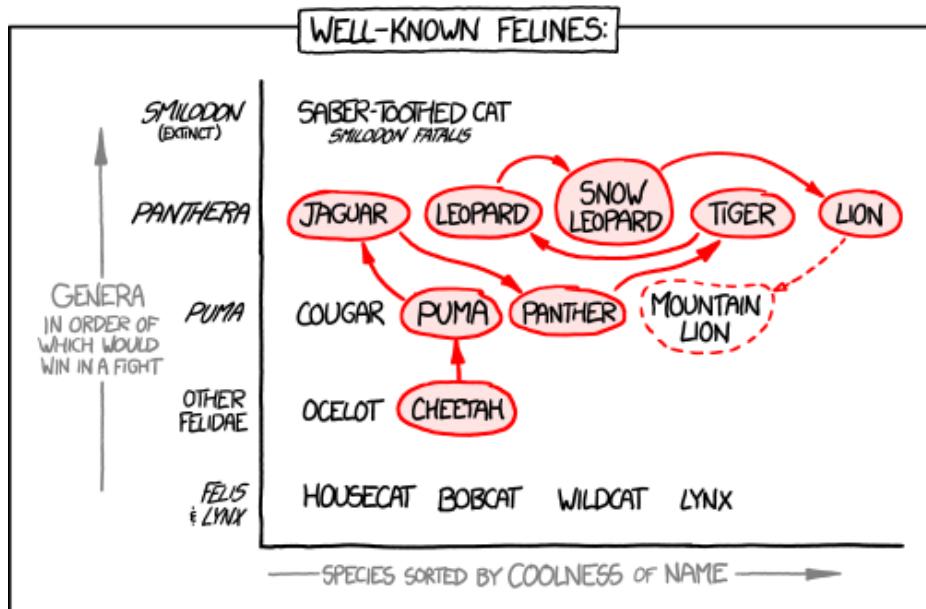
THE OS X PROBLEM

'Smilodon fatalis' narrowly edged out 'Tyrannosaurus rex' to win this year's Most Badass Latin Names competition, after edging out 'Dracorex hogwartsia' and 'Stygimoloch spinifer' (meaning 'horned dragon from the river of death') in the semifinals.

Explanation

This comic shows a graph with three parts.

First, the names are sorted up by genera (plural of genus, a low-level taxonomic rank used in the biological classification of living and fossil organisms) from bottom to top of which animals would win in a fight. Secondly, the names within the genus are then sorted by coolness of name from left to right (the degree of "coolness" of the name is apparently determined in subjective manner by the author). Thirdly, in red you can see the direction that Apple has taken with nicknaming the versions of their OS X operating system. They started at v10.0 "Cheetah", and have moved through genera from there in no order that this chart can make out.

Please note that the second words in "Snow Leopard" and "Mountain Lion" are capitalized in the table because they are used as the proper names of the operating system versions. In their normal use, as species vernacular names, they are not capitalized and are written as "snow leopard" and "mountain lion".

Bobcats are a running XKCD joke, so their inclusion is to be expected. The genus Puma here only lists synonyms for the puma (see cougar) instead of the actual genus. Of course, the three OS X versions named by three of these synonyms are not the same.

The "problem"[edit]

The title of the chart depicted on the comic ("OS X problem") could refer to one of two things:

The problem is perhaps an allusion to the travelling salesman problem, as the directed arrows and graph nodes might appear as a possible path of the salesperson between the cities. The computational difficulty of the travelling salesman problem might echo with the difficulties that the author has with trying to figure out the underlying reason for naming the OS X versions in particular order. The chart thus looks like a parody on the scientific presentation.

Alternatively, the OS X Problem refers to Apple running out of sufficiently cool and powerful cat names. After Mountain Lion, Apple would have had to significantly downgrade their naming scheme on one of the two axes. In reality, Apple moved away from cat names altogether. OS X v10.8 "Mountain Lion" was followed by releases named after Californian landmarks: v10.9 "Mavericks", named after a surf spot, v10.10 "Yosemite", named after a national park, and so on.

Title text[edit]

In the title text, a Smilodon fatalis is a saber-tooth cat, a Dracorex hogwartsia is a dinosaur whose skull looks like that of a fairy tale dragon, and a Stygimoloch spinifer is one of the last dinosaurs before the K-T (Cretaceous-Paleogene) extinction about 66 million years ago. Notably, it's possible both Stygimoloch and Dracorex are in fact juvenile members of the genus Pachycepholosaurus who were wrongly identified as a separate species, meaning two of Randall's top four coolest extinct animal names would no longer be recognized. All of the animals

mentioned in the title text are now extinct.

#1057: Klout

May 18, 2012

Though please do confirm that it's actually *me* on Klout first, and not one of my friends trying to get me punched. The great thing about this douchebag deadman switch is that I will never dare trigger it.

Explanation

Klout was a site that sought to measure your "influence" on social media networks. They sometimes gave away "perks" to the users with the highest Klout scores, as a means of advertising the products of their sponsors. Generally, the information provided by Klout was not held in high esteem. The type of person who took most interest in their score was typically not well-liked.

There are multiple ways that Klout measured your influence. An example of increasing influence is having been given a +K (a recommendation for a higher score) for knowledge about "Pitbull" (The Bud Light promoter and producer/rapper/musician, etc., not the type of dog). Another could be having an inspiring tweet that generated 2000 retweets. Klout supported many social networks, and ranked people based primarily on how much reaction they garner from the public. For example, if Selena Gomez tweeted that she simply loved a certain blog, she would probably get more people to visit that blog, and thus get a bigger Klout score, than if the mayor of Anchorage, Alaska tweeted that he liked that blog. Or xkcd publishing a comic about Klout would lead to an all time high in Google searches for it. However, their "about us" page did claim that a small, active group of followers is considered more influential than a large, passive group of followers.

The gist of the comic is that Cueball (here representing Randall) does not feel that Klout agrees with his core

values, probably as he prefers self-assurance to having an outside authority tell him of his importance to society. He uses this comic to give himself incentive to stay away from Klout. He is very clear that he is dead serious about anyone meeting him after he has (been proven to have) used Klout should punch him in the face. He even makes sure that he cannot later retract this statement, if he for instance becomes interested in Klout (something he would never wish for). Because his last statement is that people should ignore anything he says to retract this statement later.

Randall will now have a problem though because since he also posted the 706: Freedom comic earlier, he will never know if people that hit him do so because they believe he has used Klout or just to exercise their free will.

In the title text, a "dead man's switch" is any mechanism which is designed to activate if the user does not take any action. This is generally used to create a failsafe in case the user is incapacitated . For example, many exercise treadmills include a tether meant to connect the runner to the machine's base station. If the runner gets too far from the base station, the tether pulls a pin and the machine stops immediately. This way, if the runner has fallen or is struggling to keep up, the machine does not exacerbate an already unsafe situation. Randall's "douchebag deadman switch" is a variation that would trigger if he ever became enough of an asshole to use Klout. This would lead to him being constantly punched in the face, so he doesn't dare become that type of person.

Shortly after this comic was posted, a Klout user was created claiming to be Randall. This was a fake, so if you ever meet Randall in real life, please don't punch him, unless you view making a webcomic about Klout counts as interacting with it.

Klout shut down on May 25, 2018, for reasons that were never officially stated, but are generally assumed to be related to the General Data Protection Regulation, which went into effect on that day.

The Klout name may have been taken from the word clout meaning "a degree of influence" (whether social, economic, political or other), but another common context of the word is the act of striking (typically "a clout to the ear", i.e. a punch/slap, but also such as "clouted by a runaway shopping trolley") which or may not have directly inspired Randall/Cueball's suggestion that succumbing to the temptations of the 'influencer' form of clout should then make him deserving of receiving the 'punching' kind.

You were on the internet before I was born? Well, so was I.

Explanation

In this comic the man with the beard thinks he is Leet and tries to show this to his conversations partner by calling her noob (see also n00b). He claims that he has been on the internet since the BBS days, and thus long before his conversation partner was even born.

A Bulletin Board System, or BBS, is an online service based on microcomputers running appropriate software. They were the precursors to modern day online forums.

However, he is up against Jill who tells him he is wrong. She explains that her parents took samples of their sperm and egg and sequenced the DNA. The resulting genome was then e-mailed to the Venter Institute where they synthesized the genome and used this to create the egg and sperm that became Jill.

The J. Craig Venter Institute (JCVI) is a non-profit genomics research institute founded by J. Craig Venter, Ph.D. in October 2006. Although what Jill is describing may be possible this comic must take place in the future as this has not yet been used to create human beings.

Her point though is, that the man is wrong when he says that he has been on the internet. When you are "online" you are really just looking on the screen where the results found "on" the internet is displayed. So, he has been looking at the internet. The girl's genome (which is basically the closest you can come to the data a computer

would need to create you) has been sent on-line in an e-mail. So, in her words, she has actually been there.

It is also worth noting that it was technically her parents' sex cells, not her, which traversed the internet.

The title text is another common retort from "old timers" that they have been doing X since before the younger person was born. In this case, Jill accepts that the old timer was "on the Internet" before she was born, but so was she... At least in the form of her genetic information.

#1059: Bel-Air

May 23, 2012
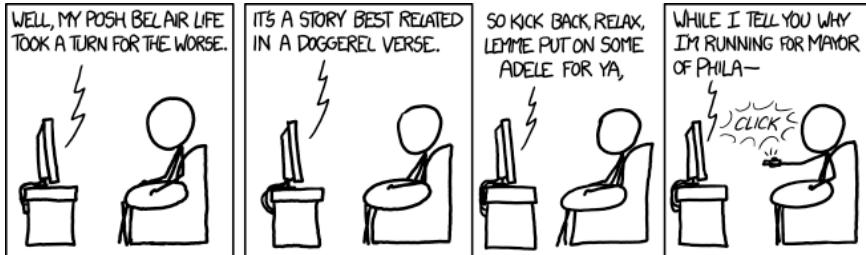
Aaron Sorkin has been tapped to write the TV movie about the aging prince's eventual election to Pat Toomey's Senate seat, currently titled either 'FRESHman Senator' or 'Mr. Smith Goes to Washington'.

Explanation

This comic is a take on the 90s TV series Fresh Prince of Bel-Air and its much parodied and repeated theme song. Consequently, the song coming out of Cueball's TV right now is a take on that song. The Fresh Prince of Bel-Air is about the protagonist (played by Will Smith) moving from the urban Philadelphia streets to posh Bel-Air; this parody is a reversal of that concept. The joke is on Will Smith going from being a successful rapper to an ambitious politician. This may be seen as a sort of gentrification of black culture, one of the main themes of the original TV series.

Doggerel is a derogatory term for verse considered of little literary value or a comic verse of irregular measure, or in this case, rap music. Obviously, the song is updated with a reference to Adele, who was, of course, not performing during the series' run, seeing as she was two years old at its start.

In the last panel, Cueball is annoyed about this stupid show and he switches to another channel or turns the TV off. The timing of the "click" indicates that he became annoyed when the song turned into a political advertisement and/or he did not want to hear "some Adele for ya" be rhymed with the name of the city Philadelphia.

The title text refers to Mr. Smith Goes to Washington, a 1939 Academy Award-winning movie about an idealistic

young man who is chosen to be a Senator and soon finds himself battling corrupt politicians, perhaps as Will Smith might be in this comic. The two characters/character and actor is a coincidence that Randall plays on. Aaron Sorkin is the writer behind the comedy drama The American President and the creator of political television drama The West Wing. Pat Toomey is a former U.S. Senator of Pennsylvania (which includes Philadelphia), who served two terms from 2011 to 2023.

The theme song of Fresh Prince of Bel-Air was also referenced in 464: RBA.

#1060: Crowdsourcing

May 25, 2012

We don't sell products; we sell the marketplace. And by 'sell the marketplace' we mean 'play shooters, sometimes for upwards of 20 hours straight.'

Explanation

Crowdsourcing is the practice of obtaining needed services, ideas, or content by soliciting contributions from a large group of people, and especially from an online community, rather than from traditional employees or suppliers. In the new Internet economy, it is not uncommon for companies to rely on crowdsourced designs or ideas, to contract the marketing to another firm, or to interact with customers through social networks established by other companies.

Cueball, however, is describing a business strategy which manages to do all three by "crowdsourcing" the process of getting a company and a prospective employee together. Cueball describes it as helping people with ideas find funding, similar to Kickstarter or Indiegogo, but rather than setting up a system to facilitate the process, he plans to use already-existing social networks (such as Facebook and Twitter). Effectively, by relying on outside support for all steps of the business plan, his company does nothing; however, because the parts of his strategy are all feasible separately, and because he describes them with a barrage of trendy buzzwords, his audience is impressed and fails to notice the company's essential pointlessness.

In the title text Cueball claims that "we don't sell a product, we sell the marketplace," a phrase that typically describes a company whose business model is to facilitate the business of other companies, and would be a

plausible reason for a company to not make products. However, this is revealed to be yet more empty buzzwords when Cueball clarifies that they don't actually do any work and instead play video games ("shooters" refer to shooter games, a genre of video game).

#1061: EST

May 28, 2012

XKCD PRESENTS

EARTH STANDARD TIME
(EST)
A UNIVERSAL CALENDAR FOR A UNIVERSAL PLANET

EST IS...

SIMPLE • CLEARLY DEFINED • UNAMBIGUOUS
FREE OF HISTORICAL BAGGAGE • COMPATIBLE WITH OLD UNITS
PRECISELY SYNCED WITH THE SOLAR CYCLE • FREE OF LEAP YEARS
INTERMITTENTLY AMENABLE TO DATE MATH

UNITS

SECOND:	1 SI. SECOND
MINUTE:	60 SECONDS
HOUR:	60 MINUTES
DAY:	1444 MINUTES (24 HOURS 4 MINUTES)
MONTH:	30 DAYS
YEAR:	12 MONTHS

RULES

FOR 4 HOURS AFTER EVERY FULL MOON, RUN CLOCKS BACKWARD.

THE NON-PRIME-NUMBERED MINUTES OF THE FIRST FULL NON-REVERSED HOUR AFTER A SOLSTICE OR EQUINOX HAPPEN TWICE.

EPOCH
00:00:00 EST,
JANUARY 1, 1970
= 00:00:00 GMT,
JANUARY 1, 1970
(JULIAN CALENDAR)

TIME ZONES
THE TWO EST TIME ZONES ARE
EST AND *EST (UNITED KINGDOM)*
THESE ARE THE SAME EXCEPT THAT THE UK SECOND IS 0.9144 STANDARD SECONDS.

DAYLIGHT SAVING: COUNTRIES MAY ENTER DST, BUT NO TIME MAY PASS THERE.

NARNIAN TIME: SYNCHRONIZED ✓

YEAR ZERO: EST *DOES* HAVE A YEAR 0. (HOWEVER, THERE IS NO 1958.)

The month names are the same, except that the fourth month only has the name 'April' in even-numbered years, and is otherwise unnamed.

Explanation

This comic pokes fun of attempts to "fix" the calendar by making it simpler or more rational, which inevitably result in a system just as complicated. This is an example of the paradox in complexity theory that if you attempt to simplify a system of problems by creating a new system of evaluation for the problems you often have instead made the problem more complex than it was originally.

Randall advertises his idea for a "Universal Calendar for a Universal Planet". He combines calendar definitions with time zone definitions. The abbreviation EST in this comic stands for Earth Standard Time (hence the title), but it is in itself a joke on the American Eastern Standard Time and the Australian Eastern Standard Time. In the rest of the explanation, EST refers to the comic's Earth Standard Time.

Length of year[edit]

Because there are approximately 365.2422 days in a solar year, various calendars use different means to keep the calendar year in sync with the solar year and the seasons. The Julian Calendar, for example, has leap days every four years, giving it an average year length of 365.25 days. The most widely used system is the Gregorian calendar, which also has leap days every four years, but skips leap days in years divisible by 100 unless the year is also divisible by 400, the latter additions come from Earth's axial precession. This gives it an average year length of 365.2425 days, which is very close to the length of a solar year (see detailed

explanation in this video: Earth's motion around the Sun, not as simple as I thought). Other calendars have been proposed, some of which do not count leap days and special "festival days" as a day of the week, in order to make every date fall on the same day of the week every year.

- At "24 hours 4 minutes", EST days are longer, though there are only 360 of them in the year. The extra 4 minutes over the course of 360 days adds up to one standard day, so Randall's EST calendar would at this point have a year that is 361 standard days long. The 24 hours plus 4 minutes length may be a reference to sidereal day, whose duration is 24 hours minus 4 minutes.

- Running the clock backwards for 4 hours after every full moon gives 8 additional hours at each full moon, twelve or thirteen times in a year. Because a thirteenth full moon will occur once every 2.7 solar years on average, this modification adds 4.1228 standard days to an EST year, bringing it to 365.1228 days.

- The doubling of the non-prime numbers of the first non-reversed hour after each solstice and equinox is a final, very complicated way to bring Randall's EST year in extremely close sync with the solar year. There are 17 prime numbers between 0 and 59 and 43 non-primes. There are 2 equinoxes and 2 solstices each year, so a total of 4x43 = 172 minutes will occur twice. This brings the average length of Randall's EST year to 365.2422 standard days, equal to the solar year to four decimal places.

Claimed benefits[edit]

Many of the claimed benefits for the calendar are highly dubious:

- While it is fairly simple to describe, EST is far from simple to

understand or put in practice. Clocks in particular would have to regularly undertake very complicated processes like running backwards or duplicating non-prime minutes.

- EST does appear to be fairly clearly defined.

- EST fails completely to be unambiguous. Following each full moon, four hours occur three times, twice forward and once backward. Several minutes are also duplicated, making times during those periods ambiguous.

- The only way EST is free of historical baggage is that it breaks free of any sensible bits of historical baggage; it keeps such things as the 30-day month and 12-month year, but adopts a different (and variable) length of day that would make it wildly out of sync with the Earth's day-night cycle.

- EST is compatible with old units, as far as seconds, minutes, and hours are concerned, though not for days, months, or years.

- EST is indeed very precisely synced with the solar cycle. The joke is that this has nothing to do with the day/night cycle or the Earth's yearly orbital cycle; the solar cycle is a period of magnetic fluctuation within the sun, lasting 11 Earth years.

- EST is free of leap years, though some EST years are 8 hours longer than others on account of having an extra full moon.

- A calendar amenable to date math makes it easy to find the length of time between two dates and times by having standardized periods of time. The complex variability of the length of EST years, days, and hours mean it is only intermittently amenable to date math, which is to say not at all.

Other features[edit]

The features of the calendar get increasingly bizarre as the

description proceeds:

- The epoch for EST is set by reference to the Julian calendar, which was superseded by the Gregorian calendar. The Epoch would be January 14, 1970 in the Gregorian calendar. January 1, 1970 in the Gregorian calendar is the epoch of the Unix time.

- The different zone for the United Kingdom is a reference to 1 yard being equal to 0.9144 meters, a pun on using imperial units instead of the metric system. This has been the joke before in 526: Converting to Metric and is also mentioned in 1643: Degrees.

- Randall does not like daylight saving time (DST) very much, as has been made clear in several comics both before and after this one. See Narnian time below. (There's possibly another level to this joke: if time doesn't pass, it's saved, fulfilling DST in a literal fashion.)

- Narnian time is a reference to the fictitious world of Narnia in CS Lewis' book The Lion, The Witch and The Wardrobe and its sequels. In Narnia, time passes much more quickly than in the real world. You could be in Narnia for several days and only a few minutes would have passed in the real world. However, synchronizing this effect would be impossible because it is not a consistent rate; it fluctuates wildly based on the whims of drama and magic. This and the DST mentioned above should be seen as a pair. Because when a country goes into DST time may not pass, which is basically what happens (more or less) when a child enters into Narnia. Whereas in EST Narnian time is synchronized to normal time, which DST is but for the one hour difference in the real calendar. Using the weird Narnian time was used as the plot in the bottom left drawing in 821:

Five-Minute Comics: Part 3.

- The Gregorian calendar does not include the year "0"; after "1" BC the next year is "1" AD. Randall's invention fixes this according to correct mathematics, only to reintroduce the problem immediately by arbitrarily omitting the year 1958. The year 1958 is significant because January 1, 1958 is the epoch (time zero) in International Atomic Time (TAI), which is part of the basis for Coordinated Universal Time (UTC). (The main difference is that TAI doesn't add leap seconds.)

- According to the title text, the month of April would become unnamed on odd-numbered years. Although this may have no impact on the mathematics of timekeeping, it would impede ability to refer to the month in writing or conversation. Notably, April Fools' Day could be restricted to the even-numbered years, else observants would be exclaiming the word "Fools!" without the usual informative "April" prefix.

#1062: Budget News

May 30, 2012
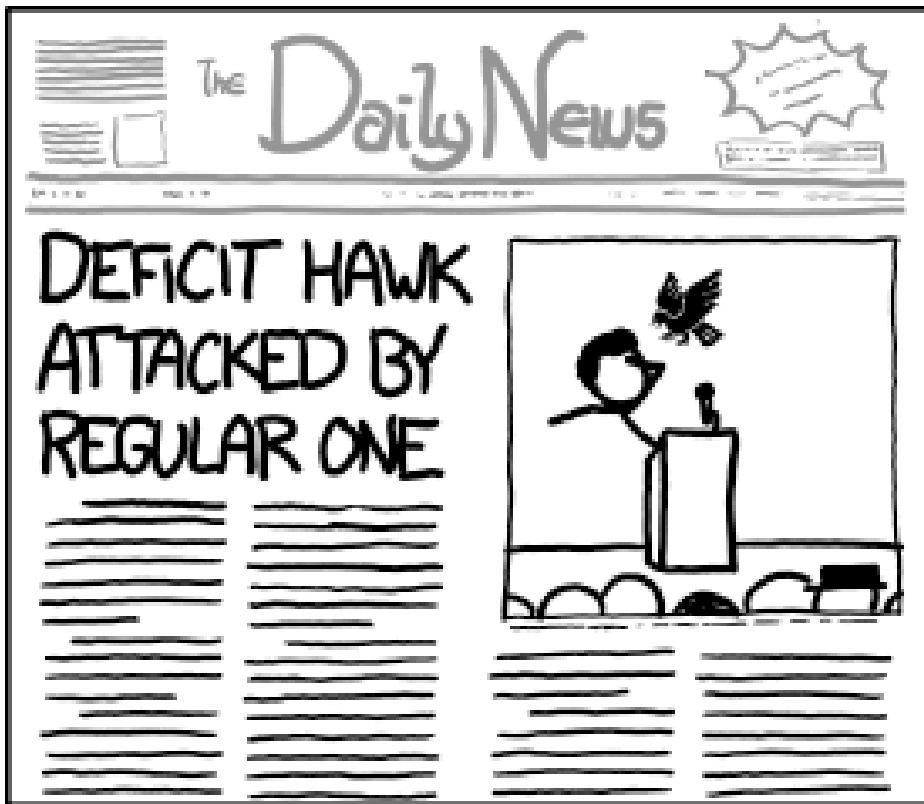
I will vote, no questions asked, for any candidate who describes themselves as 'more of a deficit sugar glider.'

Explanation

This comic is a use of homonym of the word "hawk" in the phrase "Deficit hawk". Wikipedia has a great definition: "Deficit hawk is an American political slang term for people who place great emphasis on keeping the federal budget under control. Deficit hawks believe the best way to reduce the deficit, pay off national debt, and balance the budget is by a combination of increasing taxes and cutting government spending." It is derived from the concept of a "hawk", or "warhawk", being a person who advocates aggressive foreign policy, compared with "doves" who prefer negotiated diplomacy; a deficit hawk thus tends to promote harsher economic actions to 'defeat' deficits.

And obviously, a 'regular' hawk is a bird of prey. In this case, the prey has become a politician known to be fiscally strict. This event may have been contrived, as a certain Black Hat is visible in the audience.

In the title text, there is a reference to the sugar glider, which is a small gliding possum originating from the marsupial infraclass or subclass. They are generally considered to be cute and harmless, as well as being relatively obscure, indicating a politician who is humorous and good-natured enough to make such a comparison, as well as nerdy enough to know what a sugar glider is. Having an insect diet, along with the sugary saps that inspire its name, a "deficit sugar glider" would not normally be seen as aggressive (by anyone not

relating themselves to any sort of insect) as the carnivore-inspired "hawk", but would perhaps be considered more proactive than those who might be said to equivalently tend to 'peck' at a deficit's 'peppercorn grains' and 'low-hanging fruits'.

#1063: Kill Hitler

June 01, 2012
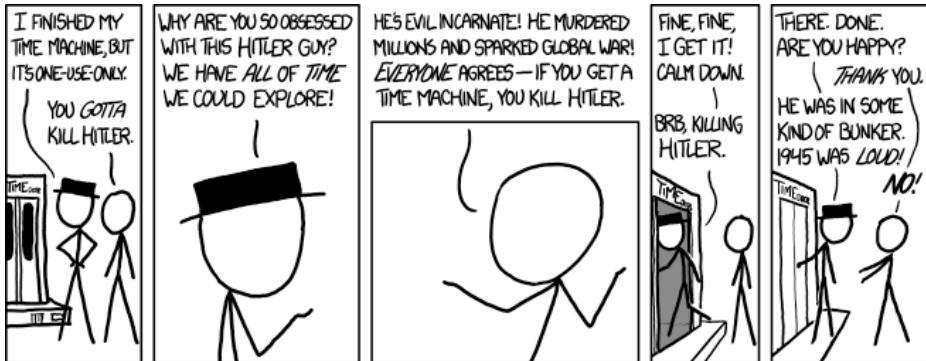
Revised directive: It is forbidden for you to interfere with human history until you've at least taken a class on it.

Explanation

Black Hat killed Hitler in the year Hitler would have died anyway, after all the atrocities he and his government committed.

After Black Hat announces his completion of a time machine which will only ever work once, Cueball gives a common suggestion for what to do when you have a time machine: killing Adolf Hitler, the Austrian-born dictator who famously led the Nazi Party to a hostile takeover of the German government, which eventually led to World War II where the Nazis conducted a military invasion of several other European countries and a genocidal campaign known as the Holocaust. Even though Black Hat has other (and probably better) ideas about how to use his time machine, he relents to Cueball's pleas and goes off to kill Hitler, comically using the casual phrase "BRB" which is an abbreviation for "be right back". He soon returns, commenting that he found Hitler in a very noisy bunker in the year 1945.

In the real world, Hitler and his wife Eva Braun committed suicide on April 30, 1945, in Hitler's personal office in the Führerbunker. Berlin was the last major stronghold of Nazi Germany at that point, and was under heavy military assault by the Soviet Union, making it fairly obvious to the Nazis that they wouldn't control the city for much longer. Germany surrendered to the Allied forces almost immediately after Hitler's death, bringing an end to the European side of the War (the

Pacific side, mostly fought between the United States and the Nazi-allied Empire of Japan, would linger on for a few more months until Japan was driven to surrender by two nuclear attacks). The fact that Black Hat killed Hitler in the Führerbunker in 1945 means that the War and the Holocaust had already resulted in the deaths of millions, and history would not be significantly changed by murdering Hitler at that point. Also, Black Hat's comment that "1945 was loud!" suggests that Berlin was already under attack when he emerged in the Führerbunker, implying that the killing took place around the time Hitler would have taken his own life anyway, possibly just a few moments before. Indeed, it is possible that Black Hat is, and always has been, Hitler's cause of death, and that Hitler did not really commit suicide; he and his wife were murdered by Black Hat, and those who discovered his body were forced to assume that he had committed a murder-suicide.

Cueball's intent was clearly for Black Hat to travel back to a time before Hitler's rise to power, in the hopes that killing him back then would prevent both the War and the Holocaust; he's therefore horrified by the realization that Black Hat had used his sole opportunity for time travel and probably made little difference at all. This is typical Black Hat behavior, going out of his way just to troll people like Cueball and cause horrible things to happen, in this case deliberately not changing any history or avoiding any of the atrocities carried out by Nazi Germany. That might be for the best, however, since killing Hitler early might cause more problems than it

would solve.

Sure enough, there are some conspiracy theories claiming that Hitler had no intention of taking his own life and was actually shot dead by someone else, most of them relying on some kind of "evidence" that Hitler and Braun weren't alone in the room when they died. If this comic was meant to be taken as a serious theory on Hitler's death, it would suggest that Black Hat was directly responsible, but because he used a time machine to reach Hitler's office, historians would have no knowledge that he was ever there and therefore could only conclude that Hitler and Braun killed themselves instead. Also, if the Novikov self-consistency principle is true, it means that Hitler's suicide was interrupted by Black Hat in the first place, and Black Hat was merely going back in time to do the thing he already did.

The title text refers to the time travel theme from the Superman movie in which Jor-El states, "It is forbidden for you to interfere with human history." Here it is suggested that Black Hat needs to know some history before going back in time to interfere with it, perhaps so that he would do the right thing and kill Hitler before the Holocaust and World War II.

#1064: Front Door

June 04, 2012
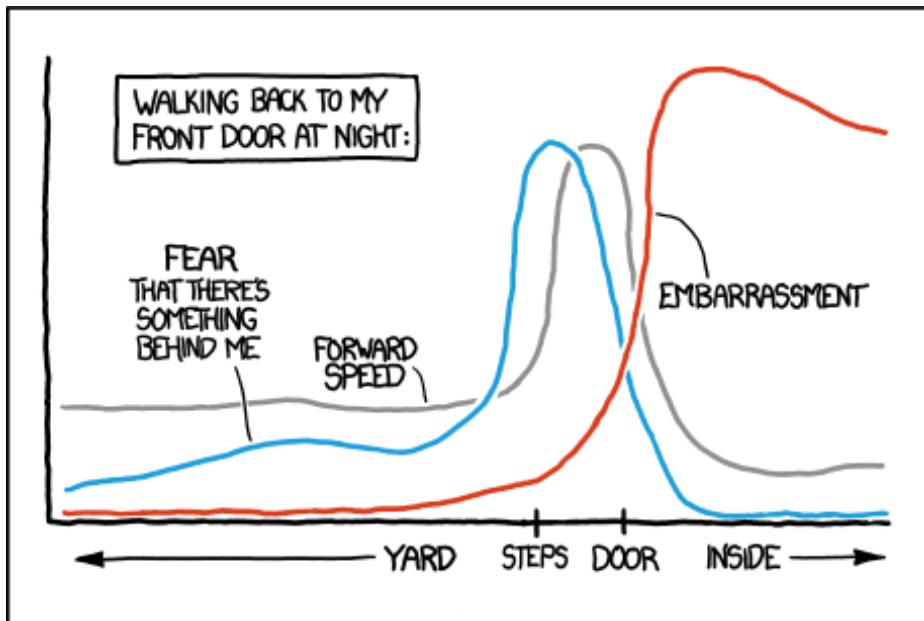
FYI: I'll be releasing a wolf into a randomly-chosen front yard sometime in the next 30 years. Now your fear is reasonable, and you don't need to feel embarrassed anymore. Problem solved!

Explanation

This comic is showing in graphical form three different actions/feelings as Randall is approaching his front door at night. His "Fear That There's Something Behind Me" rises, so then his "Forward Speed" rises to get to his door faster. And then when he gets in the door and finds that in fact, there is nothing behind him, his "Embarrassment" rises. The y-axis of the chart is not labeled, so it is presumed to indicate amount, as in how embarrassed Randall is.

The interesting fact revealed is that Randall gets more concerned that someone is behind him when he walks up the steps to this door, and not while walking in the yard where there might be more hiding places. The worst fear is just before he walks up the steps to lock himself in. This is probably because now that he is almost home and safe, he now has to fumble with the key concentrating on getting the key in the lock, thus not being able to pay attention to what's coming up behind him.

This is of course an irrational thought, but it seems to happen to many people, and has certainly been used for suspense in many movies, whether it is "Did I hear a noise upstairs?" or "Is that an axe murderer hiding in that hedge?" or "There might be a velociraptor lurking nearby". (However in all of these cases getting inside would probably not help you anyway just adding to the funny part of how the fear drops once inside. See 87: Velociraptors for why getting inside probably also would

not help against them.)

The title text attempts to alleviate the problem of the following embarrassment by introducing potential threat that could affect anybody. Since Randall mentioned that he will randomly release a wolf into a front yard sometime in the next thirty years, there will always be a fear that a wolf has been released onto your front yard. In that case, the fear one feels will be justified and not embarrassing, as it is possible that there is indeed a wolf released by Randall into their front yard. However, even assuming that Randall can find and release a wolf onto someone's front yard, the chance of this happening to you is minuscule.

#1065: Shoes

June 06, 2012
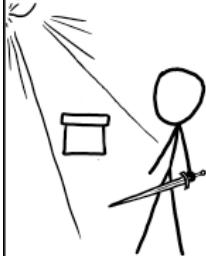
I *do* hear that they're the most comfortable thing to wear on your feet since sliced bread.

Explanation

Cueball is a knight that has saved a kingdom. It seems that he is being rewarded by a god, since his reward is inside a box that is floating in a beam of heavenly light. Inside the box is a pair of shoes with five toes - and with these magic shoes, he can outrun Death.

This comic refers to a new type of running shoes which have very little actual support with individual areas for each toe (they are supposed to make you feel like you are running barefoot). Specifically, the shoes Cueball takes out of the box look like Vibram FiveFingers.

The joke in the comic is that the shoes are so strange/creepy, that Cueball is not even sure he would want to live forever if he would have to wear these shoes at all times. Immortality is not worth it.

The title text is a play on the common phrase "x is the best thing since sliced bread". The way that Randall uses the phrase in the title text humorously implies that these shoes would be almost as good to wear on your feet as two slices of bread. Alternatively, that sliced bread had long maintained superiority in being comfortable footwear before only being surpassed by these new shoes of immortality. However, sliced bread is not very comfortable to wear on your feet.[citation needed]

Earlier in 977: Map Projections, it was stated that those who preferred the Dymaxion projection would wear

shoes with toes. And later in 1735: Fashion Police and Grammar Police it was a different type of shoes that were deemed non-fashionable with the Crocs.

#1066: Laundry

June 08, 2012
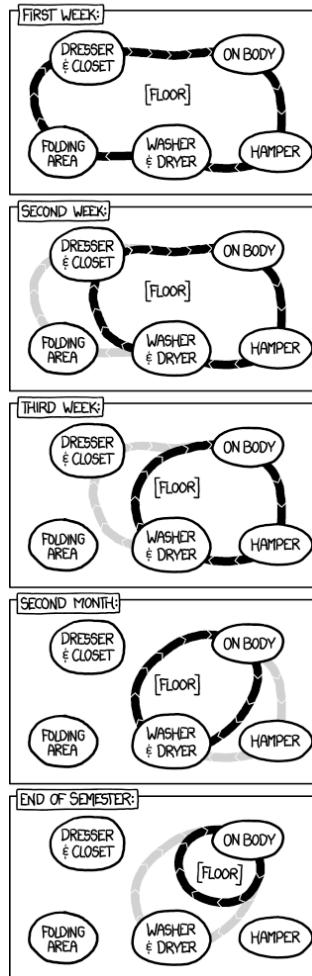
During the second semester, the path is briefly routed through the dishwasher.

Explanation

This comic is all about college laundry habits and how as time goes by, you end up just throwing clothes on the floor and then wearing them again.

In the first week, the student undertakes a proper laundry routine. However, due to increasing laziness/workload, by the second week they have abandoned folding their clothes, and by the third week no longer bother hanging them in the closet. By the second month dirty clothes are no longer stored in a laundry hamper and are just dumped on the floor, and by the end of the semester clothes are not washed at all instead rotating between the floor and the students body.

The title text seems to indicate that the student has a brainwave, some time later, to wash their clothes in the dishwasher along with the dishes. Presumably as a timesaver. The experiment was brief because dishwashers aren't actually any good at washing clothes as they wouldn't move the clothes about.

#1067: Pressures

June 11, 2012

SO ... WHAT'VE YOU BEEN UP TO?

HANDLING PATENT APPLICATIONS.

YEAH, BUT... BESIDES THAT.

THAT'S ABOUT IT.

YOU'RE NOT, LIKE, THINKING ABOUT ANY COOL STUFF?

JUST CURIOUS.
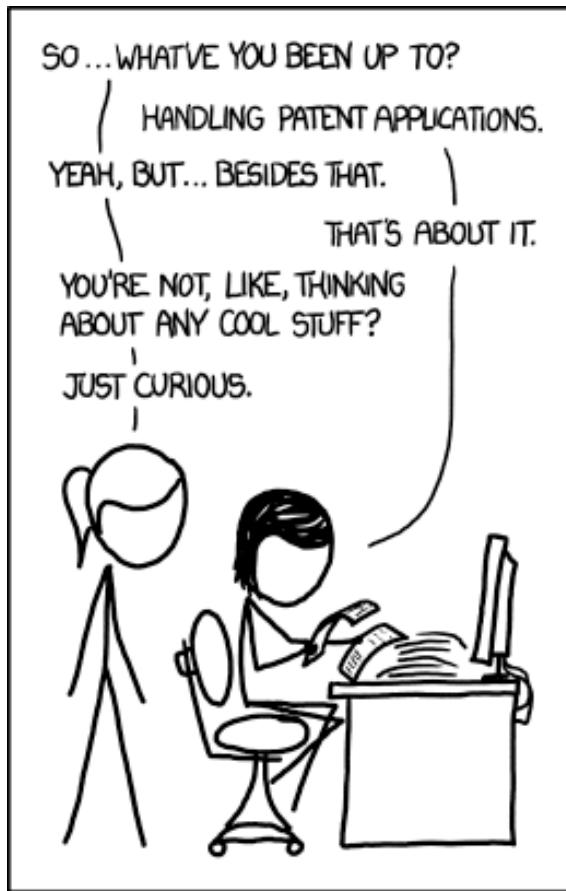
FOR THE LAST HUNDRED YEARS, SWISS PATENT CLERKS HAVE BEEN UNDER SOME WEIRD PRESSURES.

Everyone's caught by surprise when a theory of quantum gravity is developed by a sound technician wearing patent leather shoes while editing Clerks II.

# Explanation

This comic is a reference to revolutionary physicist Albert Einstein, who got his first big ideas about physics while he was working as a Swiss patent clerk. Hence, Randall jokes that there is pressure on other Swiss patent clerks to come up with genius ideas while they are working there. The Zen Pencil comic "Albert Einstein: Life is a mystery" gives some background about Einstein's choice to work at the Swiss patent office. The fact that he was turned down by several universities was beneficial to the science of physics, as the duties as a patent clerk were not challenging to him, paid enough, and allowed him to work on his theories without any pressures.

The title text refers to quantum gravity, a highly anticipated theory that would unify quantum mechanics with the currently-accepted model of gravity, general relativity. Such a theory would be very useful to understanding how space behaves at high energies and high densities, such as black holes and the very early universe. The joke is that instead of a patent clerk making this theory, as everyone is supposedly expecting, it's instead made by someone wearing "patent" leather shoes and working on a movie called Clerks II, thereby suggesting that anytime something called a "patent" crosses with anything called a "clerk", radical breakthroughs in physics result. Clerks II is the second movie in the Clerks series by Kevin Smith, widely regarded as not nearly as good as the first — which could be said about most sequels, but you get the point.

#1068: Swiftkey

June 13, 2012

Although the Markov chain-style text model is still rudimentary; it recently gave me "Massachusetts Institute of America". Although I have to admit it sounds prestigious.

Explanation

Cueball has installed SwiftKey on his smartphone and brags about this to Megan. SwiftKey is a product that is installable on iOS/Android-based phones and tablets.

Cueball explains that if you type space bar on the keyboard it auto-completes the word you are currently typing founded on its best guess, and then if you continue to press space it will add new words using this guessing process based on the previous word(s) and what it believes is the most likely words you would use in a sentence containing the previous word(s).

Megan asks what happens if you begin a new message by just using space to automatically create a text. Cueball's best guess it begins with the word SwiftKey has found to be the typical starting word and then continues as normal from that.

Megan then realizes that in this way it builds up his "typical" sentence and she tries this over the next eight small frames: I am so sorry- that's never happened before.

"I am so sorry– that's never happened before." is a typical excuse for a mishap, usually when one fails to produce an erection when it is needed. Such a phrase being quoted by an algorithm implies that such mishaps are common, and therefore "I am so sorry– that's never happened before." is a lie. Also, SwiftKey might be saying "I am so sorry– that's never happened before." because the

software doesn't know what to do.

SwiftKey has noticed their inclusion in xkcd and have created a blog post for other users to comment with their default phrase when they hit the "central prediction key". The results are pretty funny (the site now redirects to a website asking to download the keyboard, an archived version can be found here). In addition, Reddit users have a similar model creating /r/subredditsimulator, which is populated by bots generating submissions and comments based on the language of their subreddits.

In the title text, a Markov chain refers to a system that transitions between a countable number of states, based only on the current state and none of the previous ones that led up to it. SwiftKey follows this property since it provides outputs based only on the most recently entered word or words, not the whole sentence.

"Massachusetts Institute of America" is a nonexistent organization. The name appears to have formed by combining "Massachusetts Institute of Technology" and either "[Field] Institute of America" (e.g. Mining) (Wikipedia links needed) or "United States of America". This illustrates the memoryless property of a Markov chain; after generating "Massachusetts Institute of", SwiftKey may have attempted to predict the next word using only the last "of" or "Institute of". Since it was not considering the word "Massachusetts" at all, the word "America" was viewed as the most likely follow-up.

June 15, 2012

Do I get to remove letters entirely? Or just rearrange them? Because the 'k/c' situation is ridiculous. Look, we can make out whenever. This is *immortality*!

Explanation

This comic is mainly a joke on the traditional pick-up line that goes: "Baby, if I could rearrange the alphabet, I'd put 'U' and 'I' together", taking advantage of the letters being pronounced identically to the pronouns "you" and "I".

However, in typical xkcd fashion, rather than continuing with that tired pickup line, addressed at Blondie at the bar, Cueball jumps at his hypothetical chance to rearrange the alphabet and fix the English orthography.

An orthography is a standardized system for using a particular writing system (script) to write a particular language, including rules of spelling. English orthography is rather infamous for being rather complicated, due to the tendency to adopt words from other languages - each with their own incompatible orthographies - wholesale and keeping both the spelling and the pronunciation, hence the English "system" might better be described as a Frankenstein mix of multiple different orthographies. Unsurprisingly, English-language spelling reform has been a common topic of discussion over the years.

So faced with this opportunity, the hooking up could wait. Restructuring the alphabet and creating a sensibly regular English spelling is the chance of a lifetime, and would make history, making Cueball immortal in the sense of living on forever in memory, as the

alphabet-fixer.

In the title text Cueball muses on the limits of his newfound grant. Does he get to remove letters entirely or just rearrange them (like putting U and I together)? Then he mentions "the 'k/c' situation" specifically because that "situation is ridiculous". This is about the use of the letter <c> which doesn't have a unique sound on its own, most often representing a 'k'-sound or an 's'-sound. Combined with an <h> it usually makes the 'ch'-sound as in chair, although sometimes it might simply make 'k', such as in character. In more than a few cases they even make a 'sh'-sound like in champagne. see more examples here). So a reasonable change Cueball might make is to replace <c> with <k> or <s> and keep <c> only followed by <h>, or perhaps even making <c> on its own pronounced as the 'ch' as in chair.

He finishes off by stating that they can make out any other time, because fixing the alphabet now would bring him immortality.

Orthography was again the subject in 1562: I in Team. A non-standard version of this pickup joke was previously referenced in 279: Pickup Lines and later in 2794: Alphabet Notes.

#1070: Words for Small Sets

June 18, 2012

JUST TO CLEAR THINGS UP:

A FEW	ANYWHERE FROM 2 TO 5
A HANDFUL	ANYWHERE FROM 2 TO 5
SEVERAL	ANYWHERE FROM 2 TO 5
A COUPLE	2 (BUT SOMETIMES UP TO 5)

If things are too quiet, try asking a couple of friends whether "a couple" should always mean "two". As with the question of how many spaces should go after a period, it can turn acrimonious surprisingly fast unless all three of them agree.

Explanation

The noun "couple" can mean "exactly two items of the same kind," or it can be used interchangeably with words like "few" or "several", which in this context mean "comparatively small but definitely greater than one". But some people insist that "couple" can only mean two, by analogy with the specific use of the word "couple" to refer to exactly one pair of people who are in a romantic relationship.

This comic also alludes to similar arguments about the relative meaning of phrases like "few" and "several" (some people will argue that "several" should mean more than "few", while others will argue the opposite or that it doesn't matter), making this comic troll bait. Randall is attempting to "troll" (intentionally provoke) the people who claim "couple" must mean exactly two by taking the other side of the argument.

The title text similarly alludes to the argument. Randall says "Try asking a couple of friends [...] unless all three of them agree", which jokingly refers to the same group of people first by the vague term "couple," which can include three, and then specifies the exact number, resulting in a jarring effect as if a "couple" meant exactly three. The title text also mentions the sentence spacing issue as an example of another topic known to ignite energetic arguments among pedantic types without ever leading to consensus. Sentence spacing is later seen in 1285: Third Way. The sentence spacing arguments are

about whether one or two space characters must be used after the period character at the end of the sentence.

The title text also points out an unusual situation where troll baiting may not work: namely, intending to spark an argument is most effective if there is a disagreement on the matter. If all of the inquired friends have the same opinion on the matter (be it the definition of 'couple' or the number of spaces after a period), then an argument may not spark, and the trolling attempt may fail. Randall also takes a side in the title text, saying "a couple of friends" and then later "all three of them".

#1071: Exoplanets

June 20, 2012
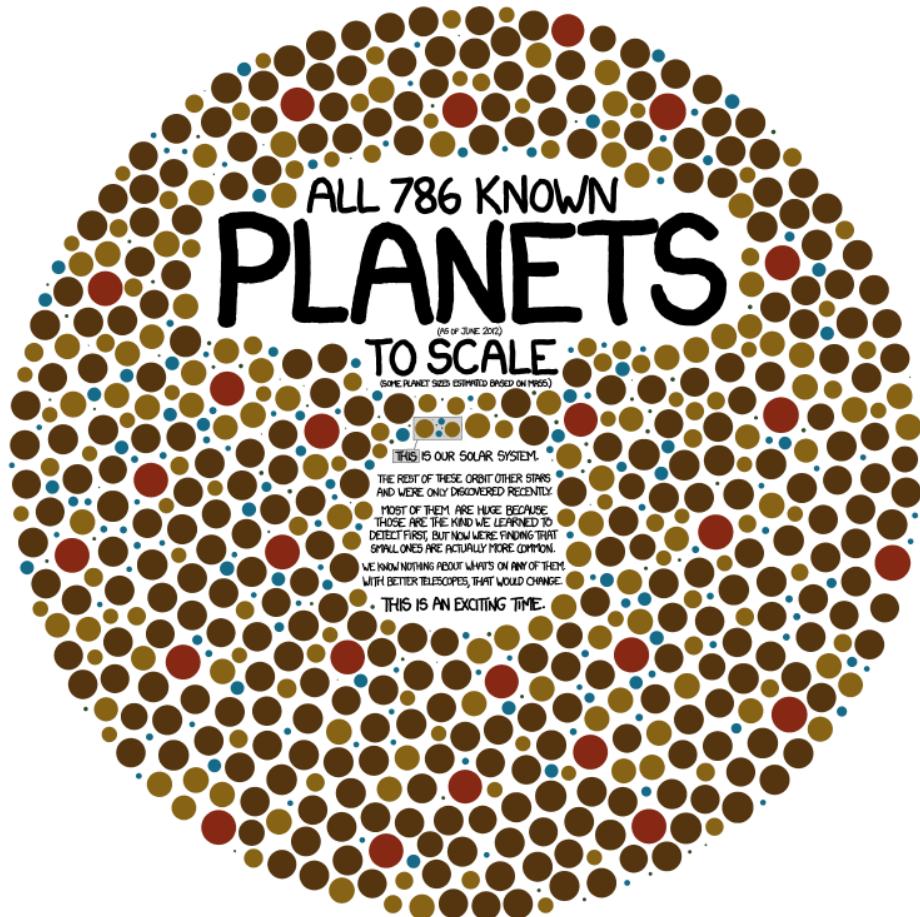
Planets are turning out to be so common that to show all the planets in our galaxy, this chart would have to be nested in itself--with each planet replaced by a copy of the chart--at least three levels deep.

Explanation

An exoplanet is a planet outside of our solar system, orbiting a different star. 786 planets were known in mid-2012: 778 exoplanets and the rest in our Solar System.

Since then, astronomers have found thousands more. In the comic, our Solar System's eight planets are depicted in the small rectangle above the central text. From this we find that the largest dots (red) and second largest dots (dark brown) indicate planets larger than Jupiter, light brown is roughly Jupiter or Saturn-sized, blue is roughly Uranus or Neptune-sized, and the tiny dots are small terrestrial planets (like Earth).

We only have a few ways of finding exoplanets. Astronomers initially used doppler spectroscopy, which detects minute changes in a star's movement towards or away from us to infer the presence of large gas giants or brown dwarfs. Currently the most successful method is to notice when a star seems to briefly get dimmer on a repeating cycle. This may indicate that a body of matter has passed between that star and us, blocking some of the light. The Kepler space telescope was designed for this purpose, and has made the vast majority of exoplanet discoveries.

Most of Kepler's discoveries are between the sizes of Earth and Neptune, but it's sensitive enough to detect planets smaller than Mercury (if the orbital plane is

aligned with us). Kepler is only able to observe relatively close stars in a narrow field of view. The great number of nearby planets implies there should be billions of planets in our galaxy, assuming our local arm is not uniquely abundant.

The title text refers to this by saying that to show them all, each dot on the chart should hold another chart with the same amount of dots; each of these dots should then also have a similar chart, and then do this one more time for a three level deep chart. This chart would have space for 786^4 planets ($786*786*786*786 = 382$ billion). Our Milky Way contains about 100-400 billion stars. But if the chart were only two levels deep there would "only" be room for $786^3 = 0.5$ billion planets.

This comic's design is similar to the Ishihara Color Test, a series of circular pictures made of colored dots, used to detect red-green color blindness. However, Randall's picture probably does not contain a hidden number like it did in 1213: Combination Vision Test.

See also Category:Exoplanets and this list of lists of exoplanets.

#1072: Seventies

June 22, 2012
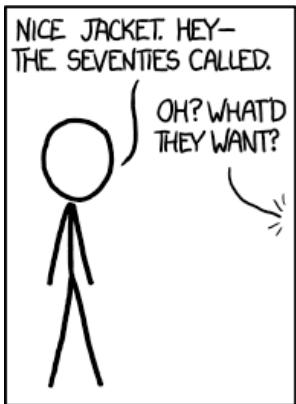
Hey, man, the 1670s called. They were like "Wherefore this demonic intrument? By what orcery does it produce uch ounds?"

Explanation

This is a take on the common insult "<year> called and they want their <item> back", used when one is wearing something out of fashion (used before in 875: 2009 Called). In this case, the comment is literally true: someone in the '70s called, but did not leave a message. Instead, the caller is puzzled because answering machines and especially voicemail were rare or nonexistent in the 1970s, and his telephone has a rotary dial, rather than a touch tone, so he can't "press" 1.

The caller is wearing flared ("bell bottom") trousers, which are frequently associated with 1970s fashion, as well as a hair-style that may be an era-consistent bleached short-perm with sideburns. The caller is somehow using time travel to directly dial a number in the present.

Originally telephones had rotary dials instead of buttons, hence the origin of the terms "dial tone" and "to dial a number". Touch tone phones were introduced in the 1960s, but weren't standard in many places until the 1980s. Rotary dial telephones used pulse dialing to transmit numbers and push-button telephones use DTMF (although phones from the '80s and '90s could often use both). Modern voicemail systems regularly don't support pulse dialing, so even selecting "1" on the rotary dial would not choose "1" in the voicemail menu system.

The title text plays off the fact that the telephone had not

yet been invented in the 17th century: in fact, all of the component technologies, including the materials used for the casing, were unknown at that point, and therefore the telephone is assumed to be supernatural in origin, with it being described as "demonic" and "sorcery". To add more to the joke, Randall uses the character "ſ" in the title text, the long s, which was used in written English to take the place of the modern lowercase "s" in the beginning and middle of words. It was phased out around the beginning of the 19th century. Thus, the title text reads: "Hey, man, the 1670s called. They were like 'Wherefore this demonic instrument? By what sorcery does it produce such sounds?'"

#1073: Weekend

June 25, 2012

Of the two Garfields, you wouldn't think the cat would turn out to be the more compelling presidential speechwriter, but there you go.

Explanation

This comic was posted right after the weekend, on a Monday, so it was on time to emphasize that we all hate Mondays.

In the first image, there is a reference to the Loverboy song "Working for the Weekend"; both the song and the panel refer to how most working and middle-class people are constantly focused on merely surviving until Saturday with enough energy to relax properly.

Cueball then goes on to state the fact that any calendar used is just a social consensus and since nature doesn't know the day of the week he simply suggest making this Monday into a Saturday. Actually, why not make all days into Saturday, to have eternal weekends?

When you actually stop and think about the speech, the argument turns into utter nonsense. Simply renaming every day on the Gregorian Calendar to "Saturday" doesn't actually do anything, and "the first Saturday of the week" would carry the exact same stigma as "Monday". Furthermore, if Cueball is proposing to abolish the work week entirely, the economy would collapse within days, hours, or possibly even minutes, depending on how quickly the news spread and how rapidly stocks started to sell. This fact may explain why the last panel is drawn in negative, with the background black. It gives a very ominous feeling to the last remark.

No confirmation has yet been found that any of these words are references to something from former US President James Garfield or to Garfield the cartoon cat who are the two speech writers mentioned in the title text. However, Garfield the cartoon cat has often bemoaned the existence of Monday (ironically, because he is a cat and not subject to the common human work schedule). And hence the title text suggest that this speech was written by Garfield the cat, and that this would be a better speech than any delivered by James Garfield.

#1074: Moon Landing

June 27, 2012

Ok, so Spirit and Opportunity are pretty awesome. And Kepler. And New Horizons, Cassini, Curiosity, TiME, and Project M. But c'mon, if the Earth were a basketball, in 40 years no human's been more than half an inch from the surface.

Explanation

The comment to which Cueball is referring is a tweet by Neil deGrasse Tyson, an American astrophysicist and science communicator. He has appeared on many different shows, ranging from The Discovery Channel to The Big Bang Theory.

There are a number of conspiracy theories claiming that the moon landing was a hoax. Tyson offers a pretty compelling argument against them, but Megan presents an even more convincing refutation, snarkily implying that NASA really hasn't done anything spectacular since 1969.

And Cueball responds with a pun on the word "burn". Burn can mean a particularly effective insult, or it can mean the consumption of fuel for propulsion. In this case, the "burn" was so effective it pushed the spaceship out of orbit (which usually takes a very large amount of burning, depending on the gravity of the planet or moon).

In the title text Randall mentions many successful NASA unmanned missions:

- The Mars rovers Spirit and Opportunity, which landed in 2004. Spirit got stuck in 2009 and shut down for good in 2010 (see 695: Spirit). Opportunity worked for over ten years on the surface of Mars before shutting down due to a loss of power in 2018 (see 2111:

Opportunity Rover).

- Kepler found many exoplanets.
- New Horizons is a mission to the dwarf planet Pluto and beyond. It did a flyby of Pluto in July 2015 and is on its way out of the solar system.
- Cassini was a probe orbiting Saturn from 2004 until its controlled entry into Saturn in 2017.
- Curiosity is another, larger Mars rover, exploring the Martian surface since August 2012.
- TiME is a proposed mission to explore the oceans of Saturn's moon Titan.
- Project M is an idea to send human-like robots to the Moon.

The final sentence of the title text notes that all manned missions since the Moon landings have taken place in low-earth orbit, which is barely far off of the Earth's surface. If the Earth were scaled to the size of a regulation basketball, approximately 24 cm (9¼ inches) in diameter, those manned missions would have all taken place within 1.25 cm (½ inch) of the ball's surface. At this scale the Moon would be at a distance of 7.7 m (25.3 ft). Unmanned missions, such as those named above or the Voyager and Mariner probes of the 1960s and 1970s, have traveled much further.

A basketball-sized Earth was the main focus of 1515: Basketball Earth.

#1075: Warning

June 29, 2012

Also possibly several miles beyond that.

Explanation

This parody of a road sign essentially reminds drivers of the reality of the situation they are now in and thereby implicitly refers to the dangers inherent to it. Because the ability to travel in a box on wheels at high speeds was not selected for in the evolution of human, if anything happens to said box on wheels, such as crashing into a wall, the humans inside may be badly injured, if not killed. Had they evolved something like exoskeletons, for example, this may not have been the case. This reminder would presumably prompt drivers to drive more carefully or perhaps slow down.

Humans did not evolve to have the ability to withstand such forces because their ancestors commonly never traveled any faster than about 20 km/h (top human speed on foot), although some individuals may have moved faster than that by falling out of a tree or off a cliff. Fast vehicles, on the other hand, have only appeared in the last couple of hundred years, and it would take many more tens or hundreds of thousands of years before these new selection pressures made any noticeable difference to human physiology, if any.

The road sign is far too lengthy and philosophical to be used in practice but is conceivable as an advertisement for safe driving.

The phrase "next 5 miles" is common to road signs, particularly those on US highways in rural areas. This is

to indicate that the conditions on the sign will continue for the next five miles along that road.

The title text refers to the fact that the sign doesn't really know how many more miles the driver may travel, and that it may be more than five. Since the average American drives over 13,000 miles per year, this is indeed very likely.

#1076: Groundhog Day

July 02, 2012

GROUNDHOG DAY DIDN'T REALLY END THAT WAY.

WHEN BILL MURRAY FINALLY SLEPT WITH RITA, IT **DIDN'T** BREAK THE LOOP.

THEY JUST KEPT HAVING SEX, NIGHT AFTER NIGHT,

FEBRUARY 2ND AFTER FEBRUARY 2ND...

...FOREVER.

BUT NOTHING IS FOREVER

NOT EVEN FOREVER.

AND THE DAY **AFTER** THAT SEXUAL INFINITY

FEB 3

WAS FEBRUARY 3RD.

264 DAYS LATER (THE LENGTH OF A PREGNANCY) WAS OCTOBER 23RD —
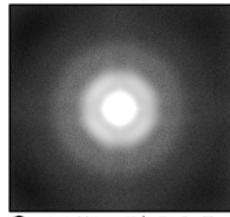
BISHOP USSHER'S DATE FOR THE BIRTH OF OUR WORLD.

If you closely examine the cosmic background radiation, you can pick up lingering echoes of 'I Got You Babe'.

Explanation

Groundhog Day is a philosophical comedy film from 1993. The main character Phil, portrayed by Bill Murray, finds himself in a time loop, which forces him to relive the same day (February 2) over and over again. This date is the titular Groundhog Day, which is celebrated in Punxsutawney, Pennsylvania, where the film is set. The folklore ritual consists in removing a groundhog from its burrow. If the sun is shining and the groundhog can see its own shadow, the winter is assumed to continue for six more weeks.

During the course of the film, Phil makes more and more drastic attempts to end the time loop, but not even suicide can prevent his waking up every morning on February 2 with the clock radio on his nightstand invariably playing I Got You Babe by Sonny & Cher. Eventually, his character improves and he finds himself increasingly attached to his coworker Rita (portrayed by Andie MacDowell). The pair gets closer, and, in the end, they sleep together. This breaks the time loop, and Murray's character can finally wake up on February 3. However, whether they had sex before this final scene is disputed, as Phil is still wearing the same clothes as the night before and, when Phil starts kissing her in the morning, Rita comments that he wasn't so affectionate the previous night. It is therefore left in doubt if they did anything more than literally sleep in the same bed. Randall was apparently not aware of this and apologized for it.

The comic assumes that the loop was indeed not broken, and that Phil and Rita simply had sex night after night for all eternity. It is then stated that not even forever is forever. This can be explained with the mathematical set theory developed by Georg Cantor. Cantor distinguished between transfinite numbers, which are larger than all finite numbers, yet not infinite, and the concept of Absolute Infinity, which he equaled with God. It was a common concern in Cantor's time to preserve the consistency between mathematics and Christian belief. Cantor's philosophical conception of infinity would allow the comic's scenario to eventually reach the transfinite date of February 3.

The last panel references the chronology of the history of the world of Archbishop James Ussher. Ussher deduced the age of the world from the timeline of the Old Testament and calculated the date of Creation to have been nightfall preceding 23 October, 4004 BC. The comic observes that October 23 is exactly 264 days after February 3, which corresponds to the average length of pregnancy. This calculation draws on Ussher's own methodology, which was basically to add the lifespans of the Old Testament genealogy. Although the universe is much older than 6000 years, chronologies like Ussher's can sometimes be found in the arguments of Young Earth Creationism. The comic might therefore be seen as a sideswipe to these theories by introducing Groundhog Day as a possible creation myth. The creation myths of many cultures claim that Earth was born by some sort primordial mother. Here, this role would be assumed by

Rita.

The title text refers to the cosmic microwave background radiation, which is often called the lingering sound of the Big Bang and regarded as a strong proof for it. If the universe were indeed the offspring of the film's protagonists, we might hear the faint echo of Murray's clock radio lingering in the cosmic background.

#1077: Home Organization

July 04, 2012

HOME ORGANIZATION TIP:
JUST GIVE UP.

Lifehacking!

Explanation

This comic is a take on the typical "how to" which details "how to" organize your home. In many cases, finding the best organization can be difficult and/or can take a long time. To skip this problem, Cueball "Just Gives Up" and puts all his items and furniture into a box labeled "Misc" for miscellaneous, with the exception of his laptop, cable modem and router.

Items in the box seem to include the following

- A TV
- A Lamp
- A Broom
- A Mattress
- A Chair
- A shelf
- At least one Cable
- And several other unidentifiable objects

The title text is a take on the popular website Lifehacker which includes all sorts of posts on how to "hack" your life and improve it. Life hacking appears to be a common theme in xkcd, such as in 2024: Light Hacks.

#1078: Knights

July 06, 2012
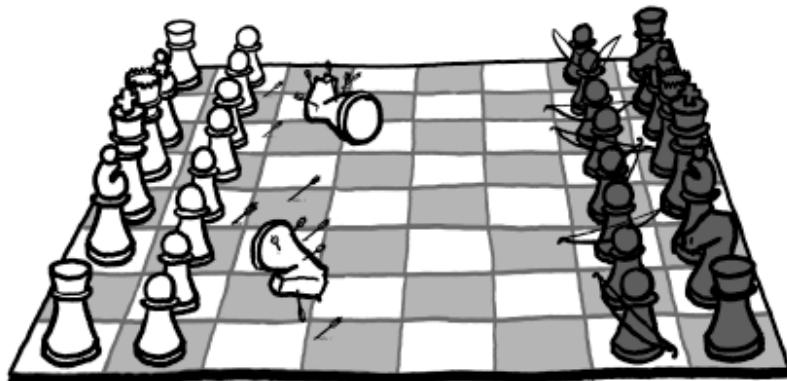
THE AGINCOURT GAMBIT

1. Nf3 ... 2. Nc3 ... 0-1

Explanation

This comic is comparing the opening moves of the game of chess to the opening moves of the Battle of Agincourt, which was fought between the English and the French in the Hundred Years War. In the battle, just like in the comic, the English used their longbowmen effectively, neutralizing the French knights and infantry. The two pieces that are moved out of the white side of the board are both the pieces known as the knights. White moves first in chess, and in the actual battle, the French knights on horseback attacked first; the English being the black pieces may also be a reference to Edward the Black Prince, who was a prominent figure in an earlier stage of the Hundred Years War. As you can see, the pawns (foot soldiers) on the right side of the chess board have bows.

The word "gambit" means "an opening in chess, in which a minor piece or a pawn is sacrificed to gain an advantage". The usual gambit of sacrificing a pawn is subverted to be a sacrifice of a high-value piece, as an analogy of what happened at Agincourt.

The title text uses algebraic chess notation. Nf3 means a knight has moved to square f3. N means knight because the king piece uses the K abbreviation. What comes after the typical chess move is what can only be read as a hail of arrows. 0-1 at the end means that "Black Wins". This implies that White resigned, as he is not in checkmate (for non-timed chess games, the only ways to win are by checkmating your opponent or by having them resign).

It seems to be an error that ellipses are included before Black's moves, as algebraic notation uses ellipses only to indicate that White's move has been omitted.

#1079: United Shapes

July 09, 2012
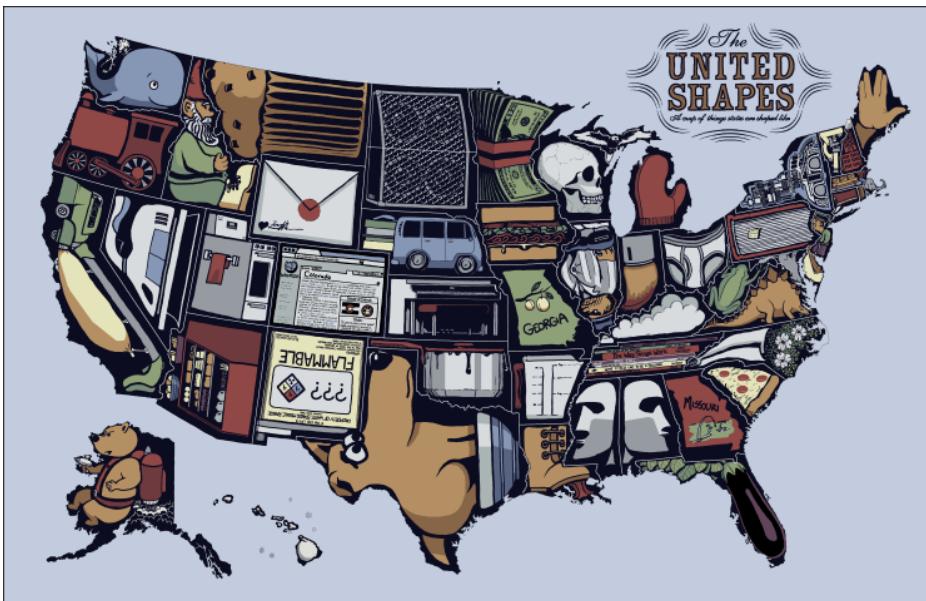
That eggplant is in something of a flaccid state.

Explanation

Very few, if any, of the shapes used are stereotypes of the state; they are merely objects that look like the state. Some of the objects are those which the states are widely known to resemble. For example, Michigan is represented by a mitten and an eagle, and a pot with handle takes the place of Oklahoma (with the panhandle region of the state filled with a literal handle). Others, however, are more creative. Few would have likely pictured Texas as a dog or Alaska as a bear with a jet pack and laser gun. There are several incredibly simple objects filling some states. Kentucky is filled by a cloud, which conceivably could have been used for any state, and Wyoming, one of the nearly rectangular states, is simply an envelope. There are three pairs of states that are related. Georgia and Missouri each contain an image of the other, drawing attention to their similar shapes, North and South Dakota are the top and bottom halves of a guitar amplifier speaker cabinet, and Alabama and Mississippi are moai facing in opposite directions.

Colorado contains what looks like a Wikipedia article. A close-up of the fake article is provided. The following references are made in the Colorado article:

- The pronunciation is not that for Colorado, but for Eyjafjallajökull, a volcano in Iceland that erupted in April 2010. There is a missing close parenthesis.
- The way it has a demilitarized zone towards Wyoming

resembles North Korea and South Korea.

- Eleven dimensions refers to string theory.

- A wormhole is a theoretical relative of the black hole. This is a reference to the television series Stargate SG-1 where a device capable of creating wormholes is located in the Cheyenne Mountain nuclear bunker in Colorado.

- A Horcrux is a type of magical object in the world of Harry Potter that prevents the creator of it from passing on. They may die, but their soul remains to be resurrected by another wizard

- The radiation zones around Longmont are caused by radioactive contamination from the Rocky Flats Plant.

- The fake motto Si parare possis, vivere septem can be roughly translated as "With preparation, survival is possible for over a week."

New Mexico, according to official transcript, is "A liquid container labeled for something of unusual and silly danger". The labeling is upside down and it refers to the nuclear testing facility White Sands Missile Range located in New Mexico for the nuclear bomb. The joke is that it presents the white sand itself as extremely hazardous. The phrase "contains chemicals known only to the state of Nevada" may be a reference to the nuclear weapons testing that occurred in Nevada (although in that case, it's not really the state of Nevada that knows those chemicals, but rather the Nevada Test Site, home of Area 51 et al), and is also a reference to California's Proposition 65 warning label, "WARNING: This

product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm."

The title text makes fun of Florida which is sometimes called "The penis of America". Obviously, this penis is somewhat flaccid (not erect). The use of the word "state" is a pun, as it means some particular condition (flaccid state) as well as a political entity (The State of Florida).
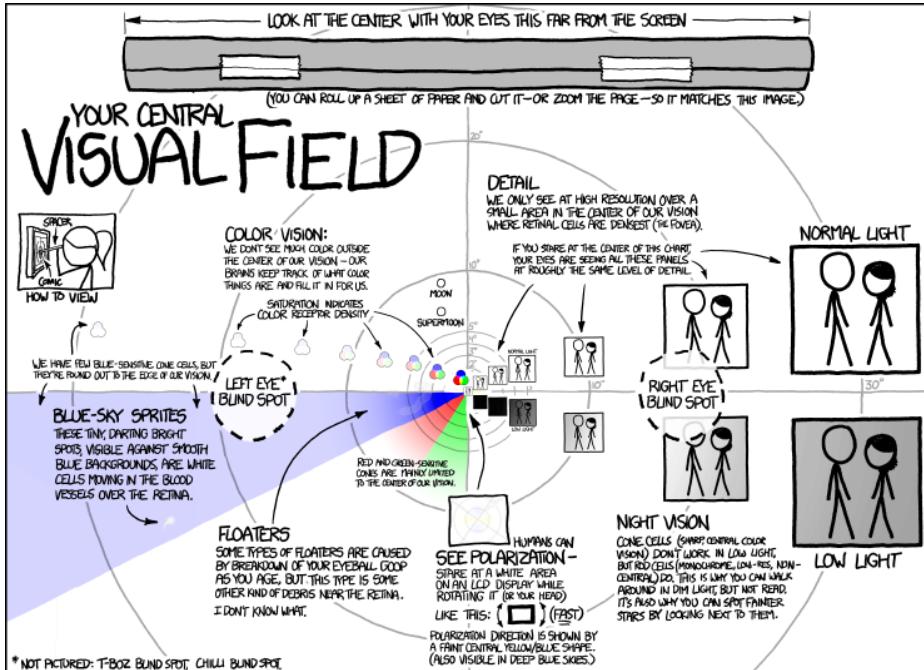
I recently learned something that solved a mystery that had bugged me since childhood--why, when I looked at an analog clock, the hand would sometimes seem to take a couple seconds to start ticking. Google "stopped clock illusion".

Explanation

This comic shows a number of vision related facts, arranged in a way that they all fit inside your field of vision (the conic area in which you can see at any given time). You're supposed to look at the center of the image while standing about a foot away from the screen (although obviously you can't read the text on the image while staring at the center).

Firstly, there's detail. The eye always sees objects closer to the center with more detail, which Randall illustrates with progressively smaller images, which are seen with the same level of detail (remember that you're supposed to be looking at the center of the image). This is because the retina is denser near the fovea, in the center.

Next, there's the topic of night vision. The color-seeing cone cells don't work so well in the dark, whereas the black-and-white-seeing rod cells do. The rod cells can see shapes well, whereas the cone cells see detail (such as change in color), which Randall uses to explain why we can't read at night.

Polarization direction can be visible when quickly changing your viewing angle. Polarization is essentially the vertical direction of waves. Light, being a wave, has a direction, and is thus polarized. Polarized lenses, for example, would have "slits" to allow only light that is polarized in a certain direction to come through (blocking the light in other directions). LCD screens

operate on the principle of blocking and rotating polarized light.

Floaters are deposits within the eye's vitreous humor. While normally transparent, they can occasionally cause refraction of light, making them visible, particularly on bright, blue surfaces. Randall points out that while some floaters are caused by breakdown over time, the others have a more mysterious origin.

Blue sky sprites, properly known as the blue field entoptic phenomenon, are bright sprites seen over bright blue surfaces, particularly the sky. They are white blood cells moving in front of the retina.

Randall also points out that colors are mostly seen near the center of our vision, with our brain keeping track of the colors of things near the outside of our visual field. The cones of blue, red and green in the third quadrant also show how red and green's sensitivity is mostly limited to the center of our vision, whereas we can see blue in a larger field of vision. Our ability to perceive saturation (the intensity of colors) is also stronger near the center of our vision.

The left and right blind spot are the locations of the optic disc, where there are no sensitive rod or cone cells, making a literal "blind" spot. The mention of the "T-Boz blind spot" and "Chilli blind spot" are a reference to the R&B band TLC, whose members go by the aliases "Left eye", "T-Boz", and "Chilli".

An image of the moon and a supermoon also appear in the image. A supermoon is when the moon is at its closest approach to Earth and coincides with a full moon or new moon, causing it to appear larger than normal. At the sizes Randall has drawn the two moons, the difference in size (approximately ten percent) is nigh-imperceptible to the naked eye; Randall seems to be making a comment about how supermoons aren't impressive to him. That he feels like this was already indicated in panel 25 of 1052: Every Major's Terrible and then later confirmed when he published 1394: Superm*n. Here is a list of all comics referring to the term.

The "stopped clock illusion" referenced by the image text is an example of chronostasis, which is an illusion where viewing movement after changing your vision is perceived as taking a longer period of time. So when we look at a clock (which we weren't previously looking at), our field of vision has rapidly changed. The second hand on the clock thus seems to take a longer period of time to move.

#1081: Argument Victory

July 13, 2012

Panel 1: I CAN'T BELIEVE YOU'RE SO WRONG. I'M BACKED BY SNOPES, WIKIPEDIA, AND A HALF-DOZEN JOURNALS. YOU'RE CITING .NET PAGES WITH BLACK BACKGROUNDS AND LIKE 20 FONTS EACH.

Panel 2: IT'S SAD HOW YOU BUY INTO THE OFFICIAL STORY SO UNQUESTIONINGLY. GUESS SOME PEOPLE *PREFER* TO STAY ASLEEP.

Panel 3: WATCH CLOSELY— I'M ABOUT TO WIN THIS ARGUMENT.
HOW?

Panel 4: BY *GOING DOWN A WATERSLIDE.*

Panel 5: SO? WHAT DOES THAT PROVE?
WHEEE

Panel 6: YOU DIDN'T WIN THE ARGUMENT!
EEEE!
SPLOOSH!

Really, the comforting side in most conspiracy theory arguments is the one claiming that anyone who's in power has any plan at all.

Explanation

Cueball is arguing with a conspiracy theorist who believes in some conspiracy, who is sitting in front of his computer talking back. They are probably using Skype, FaceTime, or another video calling service, as Cueball later asks him to watch closely, holding his phone up to show the other guy what he is doing.

Cueball's opponent seems to ignore all reliable sources, like Snopes and Wikipedia on top of several journals, instead preferring sources that are seemingly not credible (but that do agree with him). These conspiracy ".net" pages typically just have a black background and use several different sizes of fonts. Their belief seems to be the larger the font (and possibly the brighter the foreground colors, or other purely stylistic elements), the more convincing. It should be noted that".net" is used here as a catch-all for privately run websites. Of course a ".com", ".org" or other generic TLD can be used just the same for unreliable content. Cueball cannot take these kinds of sources seriously, as websites can be made by anyone and have little limitations. The maker of a private website does not need to show sources of information or even their name. As such, these websites are notoriously unreliable.

The Truth about Black Helicopters is a (satirical) example of one such website, supposedly explaining the truth behind government "Black Helicopters".

The conspiracy theorist insists that by trusting reliable

sources, Cueball is simply buying into the cover-up, suggesting that all those journalists are somehow brainwashed. Cueball says he can win the argument, and will show him how, but then ceases to argue further in favor of going down a waterslide while holding up the phone to show the other guy how to have a good time. Since conspiracy theorists tend to be intransigent, Cueball sees himself as the victor after ceasing to argue with a guy who cannot be argued with, and instead decides to have some fun. This is made even more satisfying for Cueball by the fact that it makes his opponent angry. It's likely that this is also a reference to the "Your Argument is Invalid" meme.

The joke here is also in the title of the comic which is Argument Victory something that is very hard to achieve by on the web... Cueball won this victory not by arguing but by stopping this argument he was having with someone that could/would not be argued with, and instead enjoys going down a waterslide.

The title text points out that belief in a conspiracy presupposes that those with the power to carry out the conspiracy actually have a plan, a situation which might be found more "comforting" than the alternative that those in power are just muddling through with no plan at all. This concept is revisited in 1274: Open Letter.

#1082: Geology

July 16, 2012
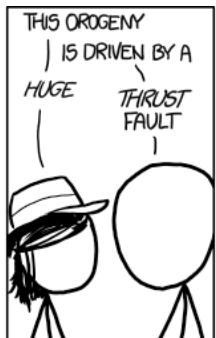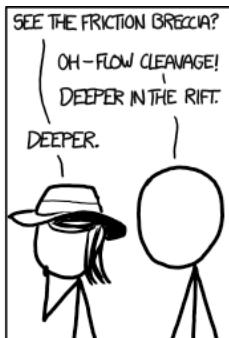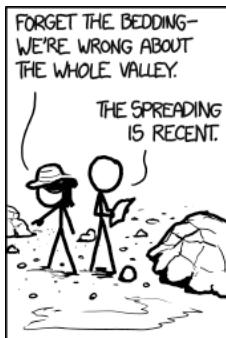
That's a gneiss butte.

Explanation

Here we have Cueball and Megan discussing geology and the words they use are ripe with puns and double entendres which also have sexual meanings. In the end, they just decide to get it on.

Specifically, the suggestive terms are "bedding," "spreading," "friction," "cleavage," "deeper in the rift," "orogeny," (perhaps a portmanteau of orgy and erogenous), "huge," and "thrust."

The technical terms are:

So it seems that Megan tells Cueball to ignore the layers in the rock, as there is evidence that the valley they are in is a recent rift valley. It was formed in cracking following the lifting up of the surrounding rocks.

The title text is a wordplay, as it could sound like "nice butt". Gneiss is a type of metamorphic rock made up of different bands, and a butte is an isolated hill with steep sides and a flat top that is smaller than a plateau. However, "butte" is not pronounced as "butt", but more like "beaut".

#1083: Writing Styles

July 18, 2012

IF YOU POST:	YOU SOUND LIKE:
"Ron Paul is the only candidate who offers us a real choice!"	A TEENAGER
"its gettin 18 so ill b here 4 prob 2 more hrs tops"	A SENATOR

THE INTERNET HAS WOUND UP
IN KIND OF A WEIRD PLACE.

I liked the idea, suggested by h00k on bash.org, of a Twitter bot that messages prominent politicians to tell them when they've unnecessarily used sms-speak abbreviations despite having plenty of characters left.

Explanation

SMS-speak is a style of communication which involves substituting numbers for letters and shortening phrases to get a longer idea across in fewer characters at the cost of readability. The practice began first with text messages, also known as SMS, or Short Message Service, which limited messages to 160 characters (exacerbated by the fact that flip phones without keyboards require multiple button-presses to type most letters or symbols using the phone's numeric keypad, making messages slow and laborious to compose and incentivizing users to minimize the length of their messages even further). Twitter has adopted a 140 character limit since its inception, which allowed any given tweet to be received as an SMS message with enough room for the user's Twitter handle (15 characters max). Randall is poking fun at both the stereotypical Senator and at teenagers supporting Ron Paul.

The dig at the senator refers to poor use of SMS-style abbreviations by older, less tech-savvy politicians who are hoping to appear more in tune with the modern world. Many politicians use SMS-speak in cases when their message isn't in danger of the character limit, but where they are appealing to a younger demographic, thinking it makes them appear to be "modern" to their target audience. In reality, it may do the opposite, showing that they do not understand why SMS-speak is used at all.

Conversely modern teenagers, often stereotyped as

lacking proper writing skills due to character limits on services such as SMS and twitter, instead here produce coherent sentences expressing a political view (this is later discussed in 1414: Writing Skills). There is a subtle dig that being drawn to Ron Paul is a stereotypical political position for a teenager, as Paul is ideologically libertarian, and the implication is that libertarianism is a position held while younger and politically or economically naive. Randall has also poked fun at libertarianism on several other occasions, such as 610: Sheeple, 1026: Compare and Contrast, 1049: Bookshelf and 1277: Ayn Random. The teenager's tweet is almost identical to the stereotypical Paul-ite comment made fun of in the title text to 1026: "Only Ron Paul offers a TRUE alternative!". A few years ago, the sentence attributed to the teenager is the sort of thing that would stereotypically be assigned to a senator, while the sentence attributed to the senator would be stereotypically assigned to a teenager - however, now the situation has changed and so Randall comments that the internet has ended up in "kind of a weird place".

The title text discusses an idea that Randall approves of, originally suggested by a user on bash.org called h00k, where a twitter bot be created to message politicians when they use SMS-speak unnecessarily. This would presumably embarrass said politicians, which might in turn lead to a decrease in their use of SMS-speak. Randall evidently considers this a good thing, suggesting he finds the unnecessary use of SMS-speak annoying.

#1084: Server Problem

July 20, 2012
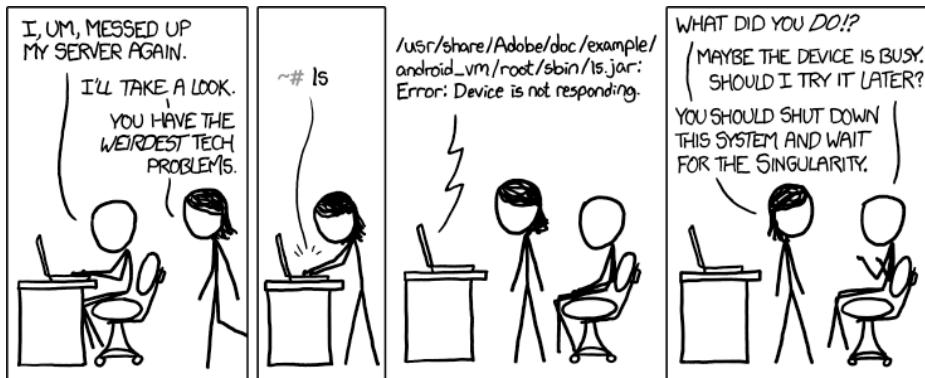
Protip: Annoy Ray Kurzweil by always referring to it as the 'Cybersingularity'.

Explanation

Cueball has messed up his Linux server (which can have the prompt ~# or ~$), apparently not for the first time. Megan offers to take a look at the PC and types in "ls" — a basic command that lists the files in the current directory. The computer returns a bizarre error message — it trips over one of the simplest commands, indicating that Cueball's system is messed up. Really messed up.

On Linux, most commands are executables usually found in either /bin or /usr/bin. The /usr/share folder, on the other hand, is where "architecture-independent shared data" is stored. Adobe is a software company that produces Acrobat, Photoshop, and a wide range of other software for manipulating work revolving around a 2D canvas. "android_vm" would likely be a virtual machine for Android. The .jar extension suggests a Java-language program. None of the above items are related to the command "ls", nor do they have anything to do with each other, with the semi-exception that Android is based on Java. Executables should also never be found within /usr/share or within directories named "example" or "doc" - indeed, by default Linux does not even look in the /usr/share directory for items that can be run unless the user tells it to do so by changing the $PATH variable. The presence of "ls.jar" within a folder called "android_vm" suggests Cueball was attempting to boot up a virtual Android device, but somehow wound up directing the Linux server to use the executable files meant for the virtual system instead of the correct ones in

/bin or /usr/bin.

In the last frame Megan is bewildered by this result and asks "What did you do!?". Cueball suggest a course of action which mimics a common error message: "[X] is busy, please try again later." Obviously he has seen this type of message frequently enough to try it as a general cure in all similar cases (even scarier, there is a good possibility that his tech issues are so bizarre that it often works for him).

Megan then tells Cueball to "shut down the system and wait for the singularity," referring to a hypothetical future event when superintelligence can be artificially created. Since future superintelligent humans/computers transcend our comprehension, we can't predict or even understand what will happen after the singularity. One interpretation is that Megan is telling Cueball that his system is such a mess that it will take a post-singularity superintelligence to fix it (or run it in its current state, as only an intelligence beyond present comprehension would be capable of doing). It also indicates that either 1782: Team Chat or 1668: Singularity could be the sequel to this comic. Since the singularity is a hypothetical event that may never happen, or may happen at a date unimaginably far in the future, Megan is essentially telling Cueball to give up completely on fixing his server. This is her way of declaring that no human can fix or understand his server.

The title text is yet another protip from Randall. Ray Kurzweil is an author and futurist who has talked and

written much about a technological singularity. Presumably, mangling the jargon (by confusing the concept of the "singularity" with the science fiction term "cyberspace") is something Kurzweil (as an expert) would find annoying. Also, as Randall later pointed out in 1573: Cyberintelligence, the prefix "cyber" has not really been used for a decade...

#1085: ContextBot

July 23, 2012

THE THINGS I PUT UP WITH...

ContextBot: (HIS BUILDING'S WIFI DOESN'T REACH THE BATHROOM.)

YOU'D THINK BY NOW I'D HAVE LEARNED NEVER TO TRUST ANYONE.

ContextBot: (SHE DOWNLOADED A TORRENT THAT TURNED OUT TO BE AN ENCRYPTED .RAR AND A LINK TO A SURVEY.)

I OFFICIALLY GIVE UP.

ContextBot: (SHE HIT ALT-TAB TO HIDE MINECRAFT AT WORK AND ACCIDENTALLY DROPPED A STACK OF DIAMOND INTO LAVA.)

SIGHHHH

ContextBot: (HE THOUGHT THESE GRAPES WERE SEEDLESS.)

EVERYONE STOPPED COMPLAINING ABOUT GOOGLE'S DATA-GATHERING WHEN THEY LAUNCHED CONTEXTBOT, A SYSTEM WHICH REPLIES TO VAGUE, ENIGMATIC SOCIAL NETWORK POSTS WITH CONTEXT FROM THE POSTER'S LIFE.

If you read all vaguebooking/vaguetweeting with the assumption that they're saying everything they can without revealing classified military information, the internet gets way more exciting.

Explanation

This comic is a commentary on the practice of "vaguebooking" or "vaguetweeting", which is posting a short message of sadness or frustration without context. This is frustrating and emotionally trying to readers because it implies something serious has happened that requires friends to provide emotional support, but may also be something trivial, and with no context it is impossible to determine whether one should worry or not.

Google has been criticized more than a few times for keeping rather extensive data records on its users, who by this point constitute most of the internet, enough to cause serious damage if Google wasn't historically altruistic (as altruistic as a for-profit company can be). In the comic, ContextBot is a fictitious Google invention which puts context for these statuses, presumably based on all that personal data which Google has collected:

- The first response is pretty self-explanatory: the original poster wants to use the Internet while on the toilet, but can't get a Wi-Fi signal there.
- The second response is about a bad torrent file the original poster downloaded. A torrent is a way to download files from a lot of different sources at the same time, thereby speeding up the process; it is typically used for large downloads such as movies, games, or Linux software distributions. Fake torrents

exist, which usually contain an encrypted .rar file which requires a password to open. To get the password, you usually need to go through a survey via the link supplied in the torrent; in some situations, you even need to pay in order to get the password. Even after that, it's quite likely that the .rar file just contains trash files, instead of the download you wanted.

- The third response is about the video game Minecraft, which has been referenced multiple times in xkcd comics. Diamonds are a very valuable resource in the game, and lava destroys items dropped into it. A "stack" of diamond are 64 individual diamonds, because diamonds can be stacked to a maximum of 64 per inventory slot. The 64 diamonds would likely represent the fruit of several hours (or days) mining. Alt-Tab is the default keybind on most operating systems to switch to a different program, while the default keybind to drop an item in Minecraft is the Q key, which is adjacent to the Tab key on QWERTY-style keyboards. Thus, it would be easy to accidentally drop an item while meaning to switch windows using the keyboard. By default, Alt-Q would only drop a single diamond, but the keybind Ctrl-Q would drop an entire stack at once. Lastly, if this player failed to Alt-Tab out of the game, they were likely caught by their colleague or boss.

- The fourth response is about how the original poster mistook the grapes as being seedless. Grape seeds taste really bitter and are uncomfortable when swallowed; this is even more annoying when the seeds are

unexpected.[citation needed]

As noted by the subtitle, ContextBot is considered a great good by everyone who was sick of vaguebooking. This also redeems Google's practice of all those data records in the public's eye.

In the ContextBot's avatar image, three people can be seen together hanging out. But the image is about to be cropped, leaving out the third person and therefore giving the impression that the two people in the cropped image are there without that person. This demonstrates how context is important to understanding a situation.

The title text refers to the cryptic ways in which someone with sensitive information must communicate. While most vaguebooking or vaguetweeting is about things of little importance, the title text implies that the things not mentioned impact national/global security. This implies that many tweets may actually be related to high-clearance military and or national security information, but must be vague in order to keep it secret, and if you take that as the context, then the internet suddenly becomes much more exciting.[citation needed]

#1086: Eyelash Wish Log

July 25, 2012

EYELASH WISH LOG

WISH BUREAU ID#:
21118378

DATE RANGE:
JAN-APR 2012

WISHER

DATE	WISH
JAN 09	THAT WISHING ON EYELASHES WORKED
JAN 12	A PONY
JAN 15	UNLIMITED WISHES
JAN 19	REVOCATION OF RULES PROHIBITING UNLIMITED WISHES
JAN 20	A FINITE BUT ARBITRARILY LARGE NUMBER OF WISHES
JAN 28	THE POWER TO DICTATE THE RULES GOVERNING WISHES
FEB 05	UNLIMITED EYELASHES
FEB 06	THAT WISH-GRANTING ENTITIES BE REQUIRED TO INTERPRET WISHES IN ACCORDANCE WITH THE INTENT OF THE WISHER
FEB 08	THAT WISH-GRANTING ENTITIES BE INCAPABLE OF IMPATIENCE
FEB 12	UNLIMITED BREADSTICKS
FEB 12	VETO POWER OVER OTHERS' WISHES
FEB 19	VETO POWER OVER OTHERS' WISHES AND ALL CONGRESSIONAL LEGISLATION
FEB 23	THE POWER TO OVERRIDE ANY VETO
FEB 27	THE POWER TO SEE WHERE ANY SHORTENED URL GOES WITHOUT CLICKING
FEB 29	THE POWER TO CONTROL THE DIRECTION NEWS ANCHORS ARE LOOKING WHILE THEY TALK
MAR 07	THE POWER TO INTRODUCE ARBITRARY ERROR INTO NATE SILVER'S PREDICTIONS
MAR 15	A HOUSE OF STAIRS
MAR 23	A UNIVERSE WHICH IS A REPLICA OF THIS ONE SANS RULES AGAINST META-WISHES
MAR 29	FREE TRANSPORTATION TO AND FROM THAT UNIVERSE
APR 02	A CLEAR EXPLANATION OF HOW WISH RULES ARE STRUCTURED AND ENFORCED
APR 07	THE POWER TO BANISH PEOPLE INTO THE TV SHOW THEY'RE TALKING ABOUT
APR 08	ZERO WISHES
APR 15	VETO POWER OVER CLOCKS
APR 22	A POKÉBALL THAT WORKS ON STRANGERS' PETS

Ooh, another one. Uh ... the ability to alter any coefficients of friction at will during sporting events.

Explanation

This comic is based on a common superstition that when someone's eyelash falls out, that person can make a wish on it. This comic appears to be a page from the fictitious Wish Bureau in charge of granting or tracking said wishes. And of course the wisher is Black Hat and he has quite a few wishes, most of them attempts to jailbreak the wishing system for his own advantage. A common trope in fiction is that wishing for more wishes is prohibited and for many of his wishes Black Hat attempts to circumvent that.

Later, in 2741: Wish Interpretation, Black Hat again gets a chance for making a wish, where the rules are discussed by the Genie that will grant him a wish.

The title text, a wish to have control over coefficients of friction during sporting events, is yet another mischievous wish. The coefficients of friction, though usually not noticed as they are unchanging, are all-important when performing physical activities — imagine trying to play hockey on a field of sandpaper or sprinting over a sheet of ice. In addition to the difficulty going where you want or getting any balls that might be in play where you want them to go in a changing friction environment, angular momentum would also be very difficult to control.

Note that when Black Hat makes meta-wishes no follow-up wishes are logged. Since the meta-wishes failed,

no valid eyelash wish condition existed and the illegal test wishes were not logged in the eyelash wish log. This means that, ironically, his attempts to get extra wishes have wasted many of the wishes he did get.

#1087: Cirith Ungol

July 27, 2012

My all-time favorite example of syntactic ambiguity comes from Wikipedia: 'Charlotte's Web is a children's novel by American author E. B. White, about a pig named Wilbur who is saved from being slaughtered by an intelligent spider named Charlotte.'

Explanation

This comic is a mash-up between the Lord of the Rings trilogy and the novel Charlotte's Web.

The title Cirith Ungol is a reference to Lord of the Rings where Frodo Baggins and Samwise Gamgee were led to Cirith Ungol by Gollum and to the lair of the ancient spider Shelob.

And therefore in this comic, Frodo (by himself, recognizable because he is holding the Phial of Galadriel and the One Ring) is being led into the lair of the spider, Charlotte. We can tell by the "Some Pig" writing in the spider web on the lower right hand corner which is a direct reference to the story of Charlotte's Web, in which a spider named Charlotte writes the very same text in her web.

The title text refers to syntactic ambiguity which is a property of sentences which may be reasonably interpreted in more than one way, or reasonably interpreted to mean more than one thing. This allows us to derive two different meanings from the same sentence.

The second part of the title text is a quote from Wikipedia, which Randall enjoys for its syntactic ambiguity, as it can be logically interpreted in either of the following ways:

• Charlotte the spider saves Wilbur from slaughter.

- Charlotte the spider attempts to slaughter Wilbur, but Wilbur is saved.

#1088: Five Years

July 30, 2012

'Well, no further questions. You're hired!' 'Oh, sorry! I'm no longer interested. There's a bunch of future I gotta go check out!'

Explanation

This comic is a take on the common and cliched job interview question here asked by Hairbun: Where do you see yourself in 5 years? The interviewer is attempting to see where the job seeker would like to take their career and also what their hopes and dreams are etc.

In the comic, instead of explaining where he would like to be in 5 years, Beret Guy and the interviewer wait around for 5 years without moving to find out. And as Beret Guy expected they stayed exactly where they were. (This could be suggesting that most people do not change much over five years.)

The title text is a continuation of their conversation in which Beret Guy turns down the job because he wants to find out what happened in the last 5 years while they were both sitting in that room.

Given Beret Guy's ability to manipulate reality (1099: Tuesdays), it's possible he froze himself and the interviewer for 5 years or sped up time to ensure that 5 years would pass quickly enough that the interviewer could not react and affect the experiment.

This is similar to 943: Empirical.

#1089: Internal Monologue

August 01, 2012
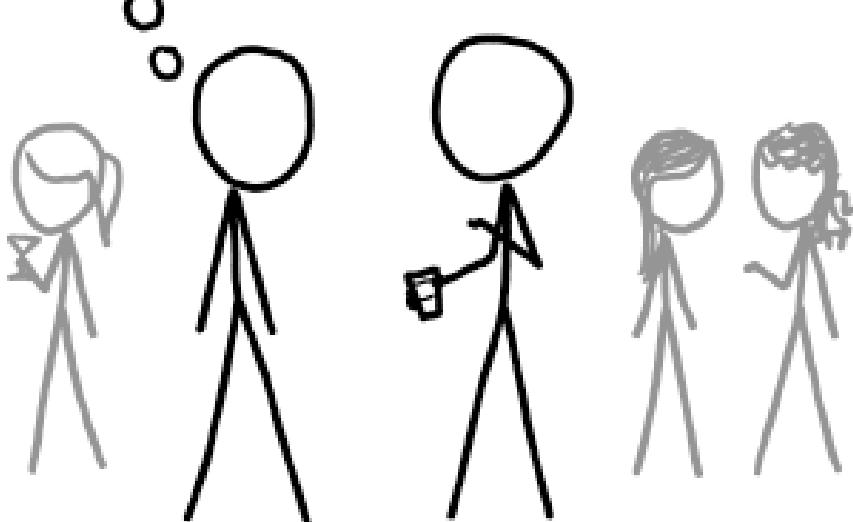
Oh right, eye contact. Ok, good, holding the eye contact ... holding ... still holding ... ok, too long! Getting weird! Quick, look thoughtfully into space and nod. Oh, dammit, said 'yeah' again!

Explanation

Cueball attempts social interaction at what looks like a party owing to the fact that several people have drinks in their hands. His internal monologue is just Cueball trying to make sure he is doing the right things in the conversation, reacting appropriately, and not saying "yeah" too much.

The title text is a continuation of the internal monologue.

This is common case of anxiety for people who are usually not very skilled in navigating social situations like parties. It can become a vicious cycle in which the fear of handling the encounter badly makes one even more uncomfortable, which in turn results in behaviour as awkward as first feared. Also, for some people it's common to want to map out a pre-planned course of action that should produce desired results, a strategy that is usually doomed to failure when dealing with sufficiently complex and unpredictable scenarios like conversations with other people. This painful, and all too common, situation has been mined for comedic effect since the beginning of human civilization.[citation needed]

This situation is especially common and difficult for autistic people, and the learned (conscious or automated) effort to appear neurotypical is known as masking and is a near-constant source of mental drain for many. Small

talk and appropriate eye contact, both mentioned in this comic, are well known to be difficult for many autistic people.

#1090: Formal Languages

August 03, 2012

[audience looks around] 'What just happened?' 'There must be some context we're missing.'

Explanation

This joke is a play on the phrase context-free grammar, which is a technical term used in formal language theory.

Cueball crashes Megan's speech on formal language theory, nonsensically shouts "Grammar!" without any context, and runs off. Because the gag is delivered in a particularly obtuse manner, the title text clears things up by having the confused audience mention "missing context", thus having them unwittingly explain the joke.

The concept of context-free grammar is incredibly nuanced and nigh impossible to rephrase in layman's terms. Luckily, the joke only interprets the phrase "context-free grammar" literally, so no understanding of the actual subject is required.

A context-free grammar can be described as a dictionary, translating single symbols to one or multiple symbols, who then are replaced again, until no further replacements are possible. If a string of symbols adheres to this grammar, it can be reconstructed solely by following these kind of orders.

#1091: Curiosity

August 06, 2012
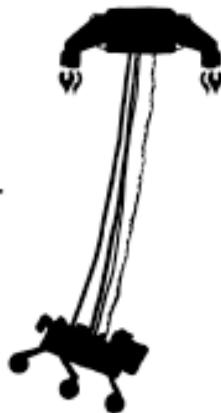
As of this writing the NASA/JPL websites are still overloaded. Trying CURIOSITY-REAR-CAM_[256px_x_256px].torrent.SwEsUb.DV DRip.XviD-aXXo.jpg instead.

Explanation

This comic is a reference to the NASA Mars Rover "Curiosity" landing on Mars on August 5, 2012 at 10:31pm PDT (August 6, 2012 at 5:31am GMT). NASA live-streamed the landing, but demand for the feed caused server issues. Thus, the time spent trying to download the landing images could be used as an excuse for things such as being late for work, falling asleep during the day, or just about anything demanding one's attention.

The title text is a reference to torrents, which are a more resilient peer-to-peer file-sharing method, due to the decentralized BitTorrent protocol, where the more people there are downloading a file, the more available it is. The name is a play on the file naming convention of release groups who name their files (typically for films or television shows) containing data on the file; source (CAM = Camera capture), language (SwEsUb = Swedish subtitles), source (DVDRip = Ripped from DVD), encoding (XviD = XviD codec) and group name (aXXo = aXXo, a well known DVD movie release group). Given that the filename is loaded with keywords that are irrelevant for a still image file, it is unlikely that this torrent will contain the expected pictures.[citation needed]

The first images received from Curiosity via the Odyssey orbiter were low-resolution thumbnails taken from the rover's rear-facing camera, thus the file name

CURIOSITY-REAR-CAM_[256px_x_256px].

#1092: Michael Phelps

August 08, 2012
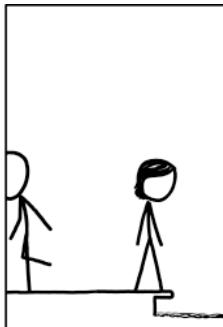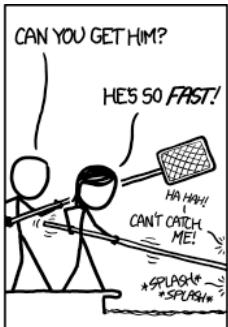
[shortly] ... he ate ALL of it!?

Explanation

Michael Phelps is an American Olympic swimmer, who could easily be considered the best swimmer worldwide: he is the most decorated Olympic athlete of all time, with 28 medals, 23 of them gold (won in the 2004, 2008, 2012 and 2016 summer Olympics, so it would have been 18 Olympic gold medals at the time the comic was published). He was most dominant in the 2008 Beijing Olympics where he won gold in all of the eight events in which he competed, the record for a single games.

Cueball and Megan find that the Olympic medalist is in Megan's pool. He refuses to leave, and is too fast to be caught. Cueball brings in boxes of Jello Mix to fill the pool with, thereby gelifying the pool and trapping Phelps or forcing him to leave.

However, according to the title text, after having waited the time necessary for the water to gelify (roughly 2 to 4 hours), Cueball realizes that Phelps has eaten all of the resulting Jello. This adds yet another level of absurdity to the situation. This may be a reference to Phelps being used to eating impressive food quantities (about 10,000 calories daily), to keep up with his strenuous exercise regimen; or it may be a reference to pictures of Phelps smoking from a bong that arose after the 2008 Olympics in Beijing, as marijuana use is often associated with an increased appetite. Otherwise, the text may simply be a reference to Phelps being capable of achieving super-human feats, such as devouring an entire pool full

of Jello. However, eating an entire pool filled with Jello is incredibly absurd even compared to these feats of consumption. Filling an entire pool with Jello would take approximately 5.5 million packets of Jello and would equate to about 440 million calories. If Phelps kept up with his 10,000 daily calorie diet and ate only Jello, it would take 44,000 days to finish the entire pool of Jello, or about 120 and a half years.

Interestingly enough, just pouring Jello powder into a pool would not solidify the water into Jello. The water would have to be boiled, then quickly chilled, for the Jello to set correctly. As Randall is a scientist, he should have known this; therefore, it's possible that he purposefully ignored this fact in favor of the humor. In 2019, YouTuber Mark Rober made a video where he showcased a pool of Jello that he had made and described the science behind it. Michael Phelps' top speed is also only around 2.3 m/s, which can easily be outrun by anyone on land.

The title text may be referenced by 1628: Magnus, where people are thrown into strange contests with others, for example a hot dog-eating contest against the championship race horse Secretariat.

#1093: Forget

August 10, 2012

WHEN WILL WE FORGET?

BASED ON US CENSUS BUREAU
NATIONAL POPULATION PROJECTIONS

ASSUMING WE DON'T REMEMBER CULTURAL
EVENTS FROM BEFORE AGE 5 OR 6

BY THIS YEAR:	THE MAJORITY OF AMERICANS WILL BE TOO YOUNG TO REMEMBER:
2012	THE SEVENTIES
2013	THE CARTER PRESIDENCY
2014	THE REAGAN SHOOTING
2015	THE FALKLAND ISLANDS WAR
2016	*RETURN OF THE JEDI* RELEASE
2017	THE FIRST APPLE MACINTOSH
2018	NEW COKE
2019	*CHALLENGER*
2020	CHERNOBYL
2021	BLACK MONDAY
2022	THE REAGAN PRESIDENCY
2023	THE BERLIN WALL
2024	HAMMERTIME
2025	THE SOVIET UNION
2026	THE LA RIOTS
2027	LORENA BOBBITT
2028	THE *FORREST GUMP* RELEASE
2029	THE RWANDAN GENOCIDE
2030	OJ SIMPSON'S TRIAL
2031	CLINTON'S REELECTION
2032	PRINCESS DIANA
2033	CLINTON'S IMPEACHMENT
2034	COLUMBINE
2035	*FORGOT ABOUT DRE*
2036	9/11
2037	VH1's *I LOVE THE 80s*
2038	A TIME BEFORE FACEBOOK
2039	VH1's *I LOVE THE 90s*
2040	HURRICANE KATRINA
2041	THE PLANET PLUTO
2042	THE FIRST iPHONE
2043	THE BUSH PRESIDENCY
2044	MICHAEL JACKSON
2045	TRYING TO SAY "EYJAFJALLAJÖKULL"
2046	THE ARAB SPRING
2047	ANYTHING EMBARRASSING YOU DO TODAY

'Baby Got Back' turned 20 this year. My favorite nostalgia show is VH1's 'I Love The Inexorable March of Time Toward the Grave That Awaits Us All.'

Explanation

The median age in USA is currently about 37 years. Assuming that you must be at least five years old to remember a cultural event later, this means that anything that happened more than thirty-two years ago is remembered by a minority of people today. This applies to any event prior to 1980, so here in 2012, the majority of Americans are too young to remember the Seventies. However, according to census estimation the median will raise in the future, so instead of a 32 years gap between event and the moment when most people can't remember it, the gap becomes 35 years (implying a median of some 40 years).

2013: The Carter presidency Jimmy Carter was the President of the United States from 1977-1981. He lost all popularity after he was viewed as mishandling several crises during his presidency, including the Three Mile Island accident, the Iran hostage crisis, and the "stagflation" of the late 1970s. According to Wikipedia, his decisions to reinstate registration for the draft and his decision to boycott the 1980 Summer Olympics in Moscow (over the 1979 Soviet invasion of Afghanistan) helped contribute to his defeat in the 1980 Presidential campaign.

2014: The Reagan shooting References the 1981 assassination attempt on the then American president, Ronald Reagan.

2015: The Falkland Islands War This is in reference to the brief outbreak of hostilities between the UK and Argentina over the Falkland Islands (Islas Malvinas) located off the shore of Argentina claimed by both but controlled by the UK. Even to this date, tensions remain high over the ownership of these islands, and while many people alive today weren't alive to witness it, it nevertheless remains present in the collective psyche of both nations.

2016: Return of the Jedi release Return of the Jedi was the 3rd film in the original Star Wars trilogy, released in 1983.

2017: The first Apple Macintosh The Macintosh was a line of computers created by Apple, first introduced in 1984, with the Macintosh 128K.

2018: New Coke References a public relations blunder that the Coca-Cola corporation undertook in attempting to reformulate its cola recipe, the new formula called New Coke popularly. The public backlash so shook the company that they reintroduced the original recipe as Coca-Cola Classic within 3 months. New Coke was eventually rebranded from Coca-Cola to Coke II, and then discontinued. Coca-Cola Classic has quietly been rebranded back to simply Coca-Cola, as it originally was. The "New Coke" introduction is considered one of the biggest PR blunders from a major company ever.

2019: Challenger The Challenger was a Space Shuttle orbiter, which was launched in 1986, but exploded 72

seconds into its flight, killing everyone aboard, including Christa McAuliffe, a teacher selected to be the first teacher in space.

2020: Chernobyl Refers to the 1986 meltdown of a nuclear power plant in the Ukranian SSR (then a part of the Soviet Union). The meltdown forced the nearby city of Pripyat to be abandoned, and it remains a ghost town today.

2021: Black Monday Refers to the 1987 day of the largest one-day stock market drop in history.

2022: The Reagan presidency Ronald Reagan was an American president from 1981 to 1989, and was a generally well received president known for ending the Cold War, oversaw the Iran–Contra affair, invading Grenada, and issuing forth a number of new economic policies.

2023: The Berlin Wall Refers to the barrier surrounding the Anglo-French-controlled part of Berlin. It was erected by the East German Government in 1961 to stop illegal emigration to West Berlin (an enclave of West Germany) after the end of the Second World War. After a friendly revolution in 1989, emigration to West Berlin (and West Germany in general) was granted suddenly and very surprisingly again on November 9, 1989. The following rush of people to the Wall from East (to cross the border) and from West (to welcome friends and relatives) in that night coined the figurative "Fall of the Wall", preceding the actual reunion of Germany in 1990

and (almost) complete demolition of the Wall.

2024: HammerTime Refers to a refrain in MC Hammer's 1990 hit song U Can't Touch This; Randall Munroe makes reference to this song elsewhere in his comics, too (specifically 108: M.C. Hammer Slide and 210: 90's Flowchart).

2025: The Soviet Union Refers to a country emerging after the end of World War I. It became the cold-war adversary of the United States after the end of World War II and only collapsed in 1991.

2026: The LA Riots Refers to the massive riots occurring at the release of the verdict acquitting the officers accused of the Rodney King beatings in 1992.

2027: Lorena Bobbit Refers to the woman who emasculated her husband in 1993.

2028: The Forrest Gump release Forrest Gump was a 1994 drama starring Tom Hanks as a mentally disabled man, telling his spectacular life story. The movie had a highly successful release, and some consider it one of the greatest films of all time.

2029: The Rwanda Genocide Refers to the 1994 Rwandan genocide, where an estimated 800,000 people were killed.

2030: OJ Simpson's Trial The O.J. Simpson trial was a famous criminal case during which O.J. Simpson, a professional football player, was acquitted of the murder

of Nicole Simpson and Ronald Goldman. He was later arrested and jailed for other crimes, including armed robbery and kidnapping.

2031: Clinton's reelection Bill Clinton was the American president from 1993 to 2001. He won his second term in the 1996 presidential election. During his second term, he faced controversy during an impeachment trial, for which he was acquitted, and a large number of pardons he made on his last day of office. Clinton was a generally favoured president, exiting his presidency with a high approval rate.

2032: Princess Diana Princess Diana was a famous Commonwealth princess who made headlines after her 1997 death in a car crash.

2033: Clinton's impeachment In 1998, the American Congress voted to impeach then-president Clinton, based on allegations that he lied about relations with a White House intern. He was later acquitted.

2034: Columbine Refers to the 1999 Columbine High School massacre, where 13 people were killed by a pair of shooters.

2035: Forgot About Dre Refers to the Grammy winning 2000 song, "Forgot About Dre," by the rapper Dr. Dre. In it, Dre complains that his accomplishments have been purposefully ignored and forgotten; ironically, at some point in the future Dre's complaints about being forgotten will, themselves, be forgotten.

2036: 9/11 Refers to the September 11 attacks in 2001, where terrorists crashed two planes into the World Trade Center towers, in New York City. Two other planes crashed that day: one into the The Pentagon, and one in a field outside of Shanksville, Pennsylvania (presumably on its way to crashing into the Capitol Building).

2037: VH1's I love the 80s I Love the '80s was a 2002 nostalgia TV series by VH1. This will make the 1980s doubly forgotten; not only will people not remember the decade, they will not remember the famous retrospective of people remembering the decade.

2038: A time before Facebook Refers to the online social media site, Facebook, launched in 2004.

2039: VH1's I love the 90s I Love the '90s was a TV series airing in 2004.

2040: Hurricane Katrina Hurricane Katrina was a devastating 2005 hurricane that hit New Orleans, killing almost 2000 people and causing 81 billion dollars in damage.

2041: The planet Pluto Pluto is a dwarf planet in our solar system. Up until 2006, Pluto was considered to be a planet.

2042: The first iPhone Apple's first iPhone was released in 2007.

2043: The Bush presidency George W. Bush was the American president from 2001 to 2009. He was criticized

for the wars on Afghanistan and Iraq, poor handling of Hurricane Katrina, and seeing the United States enter a recession. His approval peaked after the 9/11 attacks, but had fallen to historical lows by the end of his second term, making him one of the least liked US presidents.

2044: Michael Jackson Refers to the pop singer who died of drug overdose in 2009.

2045: Trying to say Eyjafjallajökull Is a reference to a volcano in Iceland that erupted in 2010. The eruption threw volcanic ash several kilometres up in the atmosphere, which led to air travel disruption in northwest Europe for six days.

2046: The Arab Spring Refers to the wave of revolutions that began in late 2010, where many Arabic nations overthrew leaders and started civil wars, with many nations converting to democracies.

2047: Anything embarrassing you do today Refers to the fact that in 35 years, the majority of Americans will not have been around on this date. However, it is to be noted that it would have to be something very embarassing for anyone more than people around or friends to notice. Usually, embarassing actions by an individual (non-celebrity) that aren't notable in some way don't end up being noticed, much less on the news.[citation needed]

The title text is in reference to the vastly over-saturated programming on VH1 dedicated to the history of the TV

universe.

#1094: Interview

August 13, 2012
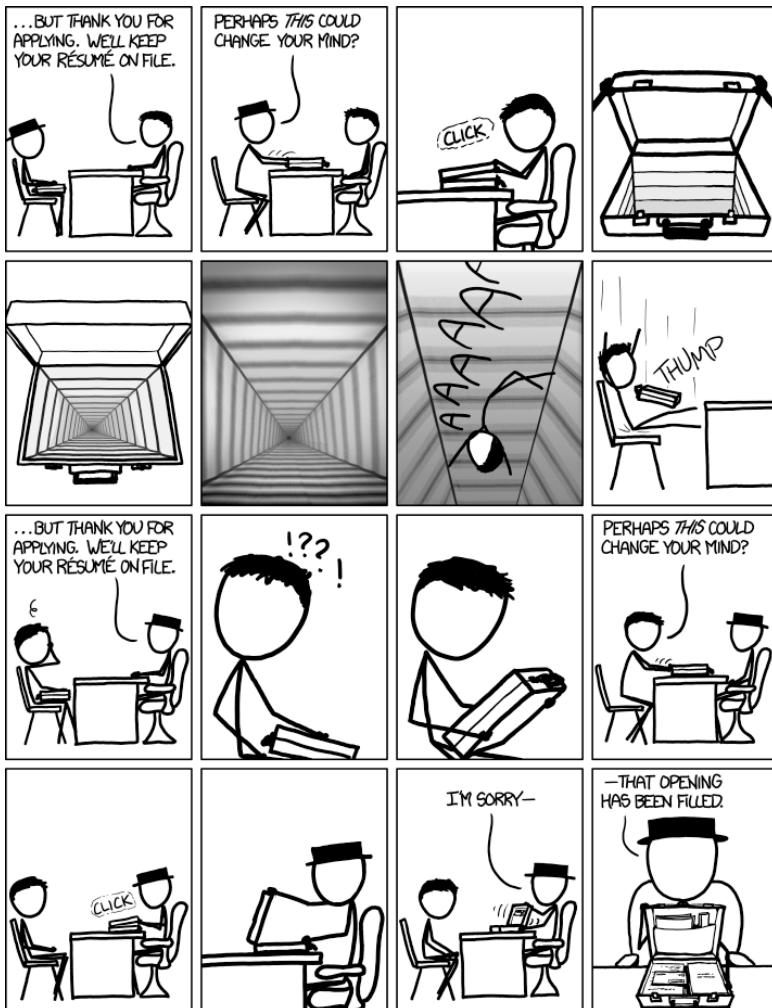
Hey, before you go, can you explain to me what job I now have?

Explanation

This comic is based on a common annoyance when job hunting, being told that they'll "keep your résumé on file", but don't offer you a job. A job interviewer, Hairy, tells Black Hat exactly that.

Black Hat offers a briefcase to his interviewer. From the vague phrasing "this" and the context, one would expect the briefcase to contain money to bribe the interviewer into hiring Black Hat. Instead, it contains a portal or gateway into an impossibly deep chasm.

After falling through the chasm, the interviewer lands in the interviewee's seat, and Black Hat is now sitting in the interviewer's seat, effectively switching their roles.

The former interviewer tries to pull the same trick on Black Hat, creating a momentary illusion of an infinite loop through recursion, a common theme in xkcd comics.

When Black Hat opens the briefcase, however, he reveals another common annoyance when job hunting, being told that the opening has already been filled. Black Hat's statement works on two levels, one meaning that "the job opening has been filled", and the second meaning "the opening to the briefcase's chasm has been filled". In the latter sense, opening may also be used as a synonym of vulnerability, in which case filled would mean patched.

The title text is said by Black Hat. It refers to the fact

that, even though Black Hat now has the interviewer's job, he has no idea what his function is.

There's a possible second meaning to the phrase "perhaps this could change your mind;" it may be that Black Hat and Hairy have quite literally swapped minds, thus why Black Hat is suddenly sitting in the interviewer's seat and finishing the interview and Hairy is sitting in the interviewee's seat being interviewed. The chasm inside the briefcase may have been a hallucination Hairy experienced whilst his mind was being swapped with Black Hat's.

Job interviews are a recurring topic on xkcd.

#1095: Crazy Straws

August 15, 2012

THE THING TO UNDERSTAND ABOUT THE PLASTIC CRAZY STRAW DESIGN WORLD IS THAT THERE ARE TWO MAIN CAMPS: THE *PROFESSIONALS* — DESIGNING FOR ESTABLISHED BRANDS — AND THE *HOBBYISTS.*

THE HOBBYIST MAILING LISTS ARE FULL OF DRAMA, WITH FRICTION BETWEEN THE REGULARS AND A SPLINTER GROUP FOCUSED ON *LOOPS* ...

HUMAN SUBCULTURES ARE NESTED FRACTALLY. THERE'S NO BOTTOM.

The new crowd is heavily shaped by this guy named Eric, who's basically the Paris Hilton of the amateur plastic crazy straw design world.

Explanation

A subculture is a small group of people within a culture that share some property in common, such as hackers or hipsters. Some subcultures form based on a geeky obsession over a trivial topic (for instance, a minimally-drawn webcomic). In this case, that topic is crazy straws, which are toy drinking straws designed with unusual twists and loops. This strip uses this group as an example of the fractal nature of cultures.

Informally speaking, a fractal is a mathematical shape with an infinite level of detail. Just as fractals can always be divided into smaller patterns, Randall points out that human subcultures can always be divided into smaller subcultures. We have the "people who like crazy straws" subculture, but this is further divided into the professionals and the hobbyists. The hobbyists are themselves broken into those who accept loops in the straws and those who don't. A splinter group, as used in the comic, is a subculture that breaks off from a larger one. Of course, this nesting is not really infinite, since there is a finite number of people living.[citation needed] The claim that it is infinite is hyperbole.

Despite the incredible amount of work fans put into it, the whole concept seems completely inconsequential to an outsider. This irony is the source of humor in this strip. An earlier comic covers a similar topic.

Paris Hilton is a celebrity who is essentially famous for

being famous. The "guy named Eric" mentioned in the title-text is someone prominent in the amateur plastic crazy-straw community, but that doesn't really count as famous by most standards, so the Paris Hilton comparison is quite a stretch.

#1096: Clinically Studied Ingredient

August 17, 2012

I CAN'T HELP BUT ADMIRE THE AUDACITY OF THE MARKETER WHO CAME UP WITH THE PHRASE "CONTAINS A CLINICALLY STUDIED INGREDIENT"

DON'T WORRY—I'VE BEEN TESTED.

... AND YOU'RE CLEAN?

SO MANY QUESTIONS!

Blatantly banking on customers not understanding that it's like a Hollywood studio advertising that their new movie was 'watched by Roger Ebert'.

Explanation

This comic is poking fun at a phrase which some ads use to boost sales of their product. They state that their product contains a "clinically studied ingredient", which consumers assume means that the ingredient has been clinically tested and proven effective, or at the very least, not harmful, although neither is, strictly speaking, implied by that statement. An example of this appears on many body wash products, bearing the phrase "Tested by dermatologists for sensitive skin" or something similar. The phrase just states that an ingredient was clinically studied and doesn't mention the findings of that study (which, for all we know, could have found the ingredient to be ineffective or harmful). In other words, the phrase is used in deceptive marketing techniques, leading consumers to believe something which encourages them to buy the product, without committing to saying it explicitly.

In the middle of the conversation, a woman tells Cueball that she has been tested, presumably for Sexually transmitted diseases. However she does not reveal the results of the tests, which is the primary information Cueball could be worried about, and when Cueball inquires, she acts like he is being unreasonable to also want that information. In this way, Randall is making an analogy to how a marketer might think consumers would be unreasonable to want to know the results of the clinical studies on the ingredient.

The title text mentions the legendary film critic Roger Ebert. At the time this comic was published (a year before Ebert's death), one could expect him to have watched most big-name movies that were coming out. Simply stating that he saw a movie, therefore, does not necessarily mean that he liked it.

Impressive-sounding but meaningless advertisement claims are also the subject of 624: Branding, 641: Free, 870: Advertising and 993: Brand Identity.

#1097: A Hypochondriac's Nightmare

August 20, 2012
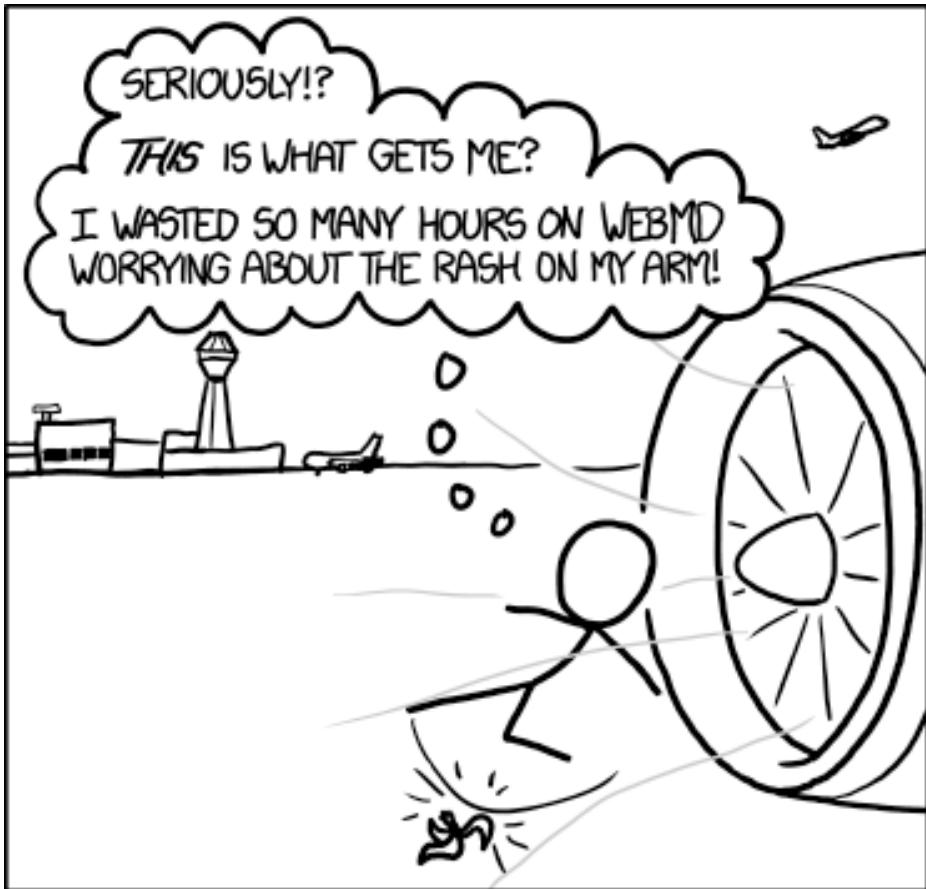
BUT WHAT IF I REASSURE MYSELF WITH A JOKE AND THEN DON'T WORRY ABOUT THE RASH AND IT TURNS OUT TO BE DEATH MITES AND I COULD HAVE CAUGHT IT

Explanation

Hypochondriacs are people who worry obsessively about their health, often looking up symptoms on the Internet and convincing themselves that they have some deadly disease. The situation depicted in this comic is described as a "hypochondriac's nightmare" because Cueball, expecting that the rash on his arm was some mysterious undiagnosed disease, spent several hours on WebMD (an online health symptom reference) looking up symptoms, yet ends up dying by slipping on a banana and getting sucked into an airplane engine. Thus he regrets wasting so much time on an ultimately fruitless task rather than something more productive to survival, such as, say, watching out for banana peels lying in front of jet engines, or at the very least, attempting to enjoy life.

The title text (in ALL CAPS thus shouting in despair) adds another level of hypochondriasm. Randall drew this particular joke to soothe his fears and reassure himself that the rash is nothing. But what if that reassurance just makes him not check out the rash, and then it turns out the rash is caused by "death mites" (which do not actually exist)[citation needed] and ultimately kills him when he could have prevented it?

#1098: Star Ratings

August 22, 2012

UNDERSTANDING ONLINE STAR RATINGS:

★★★★★ [HAS ONLY ONE REVIEW]

★★★★⯪ EXCELLENT

★★★★☆ OK

★★★⯪☆

★★★☆☆

★★⯪☆☆   CRAP

★★☆☆☆

★⯪☆☆☆

★☆☆☆☆

I got lost and wandered into the world's creepiest cemetery, where the headstones just had names and star ratings. Freaked me out. When I got home I tried to leave the cemetery a bad review on Yelp, but as my hand hovered over the 'one star' button I felt this distant chill

...

Explanation

This comic deals with the idea that users when viewing online star ratings are usually heavily biased towards the best possible rating (five stars). As there are nine possible scores in the rating system in the comic (1 star, 1.5 stars, 2 stars...4.5 stars, and finally 5 stars), a rating of 3 out of 5 stars is supposed to represent "average" or "mediocre". Thus, anything above 3-and-a-half stars is supposed to be "good" and anything below 3-and-a-half stars is "bad". However, most people consider a four-star rating to be "OK", and everything below as "crap".

The title text may refer to the folkloric practice of attributing a feeling of a chill to someone walking on your future grave. When Randall is back home he would like to give a bad rating on Yelp — a corporation that operates an "online urban guide" — and hovering his hand over the 'one-star' button, he was just 'walking' over the rating on his own future grave.

Another possible explanation for the title text is that the headstones are from people who gave the cemetery star ratings and were then murdered, having their given ratings displayed in the headstones. This would explain the chill Randall feels before clicking the one-star button.

Finally, the "world's creepiest cemetery, where the headstones just had names and star ratings" could simply be Randall not understanding he was in a Jewish cemetery where headstones have Star of Davids on them.

Note that these would exclusively be hexagrams, rather than the more usual five-pointed/ten-edged variety of concave star polygon used in actual rating systems.

See also: 937: TornadoGuard, another comic about star ratings.

#1099: Tuesdays

August 24, 2012

Try our bottomless drinks and fall forever!

Explanation

Beret Guy and at least one other person (Megan, Danish, Hairbun or Jill) are sitting at a restaurant. The waitress, Ponytail, tells Beret Guy there is a special on Tuesdays for "endless wings". Restaurants often have different daily discounts to encourage people to come in. In a normal restaurant, "endless wings" would presumably refer to "all-you-can-eat" chicken wings, meaning the customer can pay a flat price and eat all the chicken wings they want without having to pay any more.

However, in this comic, instead of ordering them by telling the waitress: "I'll have those", Beret Guy tells her: "i have those", meaning that he already has literal "endless wings" (similar issues of things being taken literally are referenced in 1086: Eyelash Wish Log and 1528: Vodka), and then begins to grow wings which ultimately appear "endless" as they grow to a span of at least the circumference of the Earth by the last panel (and presumably continue growing). The other characters scream in horror for obvious reasons.

The title text plays on another common restaurant offer of "bottomless drinks", meaning unlimited free refills of drinks. However, falling into something literally bottomless (i.e. without a bottom) would result in falling forever. (However, even this is unlikely unless the diameter of the cups that the drinks are served in is large enough to fit a whole person into.) If it was literally "bottomless", you would start to decelerate as you pass

the earth's center of mass. The air pressure and heat in a "bottomless" pit would also be fatal to humans.

This is one of the few comics with lowercase text.

#1100: Vows

August 27, 2012

So, um. Do you want to get a drink after the game?

Explanation

This comic is a joke parodying wedding ceremonies and American Football plays intended to misdirect or fool the opponents about what is really happening.

A standard misdirection play involves the offense misdirecting the defense into thinking that the play being executed is actually a different play: for example, a passing play could actually be a running play, or that a ball being run left is actually being run right, or that a field goal or punt end up being attempted to get a down.

In this comic, Cueball is about to get married to Amy, a girl looking like Megan, but the bride interrupts the ritual by saying that she doesn't want to get married. The bride then reveals herself to be a Cueball-like man and after questioning reveals that the relationship and the wedding was an elaborate con to get the advantage on the football field. "Amy" turns out to be a player for the opposing team and he had a football on his person. He then proceeds to run the ball in for a touchdown. This clearly constitutes the greatest high school football misdirection play of all time. [citation needed]

Randall takes the deception in a misdirection play to the next, virtually impossible level; it is unlikely that a relationship could develop to the point of marriage within the time-frame of a football game, with "the groom" not noticing that Amy was in fact a football player, or that he was standing on the football field.

The title text indicates that, in spite of the deception, "the groom" still has feelings and is not ready to give up the relationship (or at least he would like to share a beer with the opposing team like after a friendly game). Alternatively, as it is unclear who is speaking, "the bride" may have also developed feelings for "the groom" and is now awkwardly asking for a date after deceiving "the groom."

Misdirection Plays[edit]

Occasionally, especially at the high school level, extreme misdirection plays are attempted where teams try to misdirect the opposing team into thinking that a play is not even being run. Good examples of that can be found on YouTube, such as this "wrong ball" trick, or that "five more yards" trick. Despite conforming to the rules of the game, these are considered to be dirty tricks and usually only work in little league football.

factory --- spire --- onslaught --- extractor --- judge

Explanation

Sketchy is an adjective meaning not thorough or detailed, but which in modern slang is often used to connote creepiness, or a general feeling that something is not quite right. Urban Dictionary provides a good definition of "someone or something that gives off a bad feeling".

In this comic, Randall rates words by how sketchy they make the sentence "Hey baby, wanna come back to my sex ____?" when inserted into the blank. As noted from the scale (which already starts at "sketchy" and goes up to "very sketchy"), the sentence itself is already inherently sketchy, in that it sounds like it would be a pickup line delivered by a person attempting to solicit sex from a stranger.

The sketchiness is increased by the various words which run from the relatively common or understood to the obscure and unusual.

The first few are actual terminology: A sex party or sex orgy are basically group sex parties at which multiple parties engage in sexual activity. A sex dungeon is a location where BDSM (bondage/submission — think leather and handcuffs) activity is engaged in. "Sex House" is the name of an Onion News Network parody of reality shows like Big Brother.

As the scale increases, the words become simply locations where sex might take place, which increase from

comfortable to unusual and creepy (i.e. sex crate, sex ravine, sex tarp). It is particularly sketchy because of the phrasing of the sentence which implies the speaker has a specific [insert word] used for sex. It might be sketchy enough to walk up to someone and suggest "let's go down in the ravine and have sex", but it is made sketchier when the phrasing suggests going to "my sex ravine".

The title text continues the thought process with further possible sketchy words, beginning with more odd locations and moving on to "onslaught", an abundant wave of attack or overwhelming amount of something — in this case sex; "extractor" suggests some sort of device that might force someone to have sex; and finally "judge", suggesting the speaker has someone in mind to judge sex. Very sketchy indeed.

#1102: Fastest-Growing

August 31, 2012
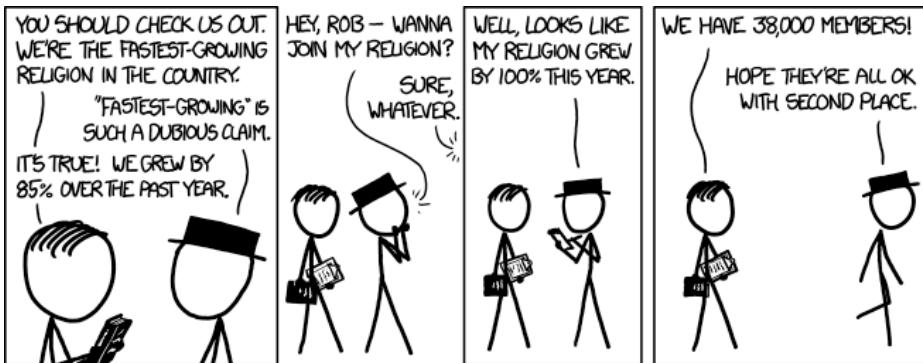
I lead a small but extraordinarily persuasive religion whose only members are door-to-door proselytizers from other faiths.

Explanation

This comic talks about the misuse of percentage of growth. It can be misleading for gauging the importance or popularity of something; If you add only 4 members to an existing group of 2, you would have achieved a growth of 200 percent.

In the case portrayed in this comic the claim appears to be that the other person's religion grew by 85%. Black Hat attempts humorously to show the flaw in using that statistic by growing his group by 100% (therefore, presumably, first place), which he simply does by adding his friend Rob to his religion, and thus increasing his membership from 1 to 2. The other person then says that his religion has a significant number of members (and not just one or two, but ended up with 38,000 this year, presumably having 'only' around 20,540 in the prior one), but Black Hat doesn't care and responds that he hopes they are all okay with being "in second place" since the main argument from the other guy was about being the fastest-growing.

The title text ponders the ironic idea of converting only the zealous door-to-door proselytizers to a very persuasive religion of one's own. It is also possible that after the last panel, the proselytizer would have joined Black Hat's religion to be first by this metric and Black Hat played the same trick several times to get many proselytizers join his religion.

Another interpretation is that the title text could be another way that Black Hat could take the 'fastest-growing' claim out of context to make it meaningless. By composing his religion of the unwitting proselytizers of other faiths, he can claim the highest ratio of converts to current adherents. Note that the amount of people converted is often exaggerated by groups that try to spread a faith. Although the beliefs spread by his proselytizers vary widely, Black Hat is not concerned with what his so-called followers believe. Thus, he can claim the title of fastest-growing religion without having any value to his religion.

Various religions and groups encourage their members to actively recruit new followers, such as the Mormon missionary (or "Missionaries of the Church of Jesus Christ of Latter-day Saints", to use their own more acceptable full name).

#1103: Nine

September 03, 2012

EVER SINCE I HEARD THE SIMILE "AS NEGLECTED AS THE NINE BUTTON ON THE MICROWAVE" I'VE FOUND MYSELF ADJUSTING COOK TIMES.

FYI: If you get curious and start trying to calculate the time adjustment function that minimizes the gap between the most-used and least-used digit (for a representative sample of common cook times) without

altering any time by more than 10%, and someone asks you what you're doing, it's easier to just lie.

Explanation

Most common cook times are given in either whole, half, or quarter minute increments; e.g., 2:00 min. or 1:30 min, meaning that 1, 2, 3, 4, 5, and 0 are the most used digits on the microwave (because microwave times are usually less than 6 minutes), and to use numbers like 6, 7, 8, or 9, one would have to cook something for that number of minutes. Cueball, however, feels bad for the under-used number '9,' so he microwaves his food for one minute fifty-nine seconds instead of two minutes, as a one-second difference is negligible.

Also, in Randall's book Thing Explainer, every number from one to ten are in the top thousand most used words except nine, which is labeled "the number after eight", "one more than eight", or (when referring to the Ninth Amendment) "Change After Eight". This shows how the other numbers are used much more than nine.

The title text is reminiscent of comic 245: Floor Tiles.

#1104: Feathers

September 05, 2012
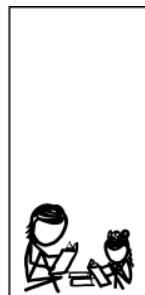
Click to see a video of a modern bird using stability flapping during predatory behavior. It all fits! Also, apparently Microraptor had *four* wings? The past keeps getting cooler! (And there's more of it every day!)

Explanation

Dinosaurs have been a fascinating topic in popular science and have captivated children's interest since the first fossils were discovered in modern times, around the 1700s; prior discoveries in China and elsewhere were thought to be the bones of dragons or other mythical creatures. The success of the Jurassic Park movies perpetuated an erroneous understanding of the physical characteristics of dinosaurs. Since the first movie of that series, scientific evidence has emerged suggesting that Dromaeosauridae, or "raptors", the main antagonists of that movie, looked quite different from their animatronic and CGI versions. In particular, they are now known to have been much smaller, and are believed to have had feathers and even wings, as evidenced by quill nobs observed on the arms of raptors.

Denver W. Fowler is among the scientists who support this hypothesis. (incidentally, a "Fowler" is a hunter of wildfowl/birds) The comic refers to a publication by him and his colleagues ("et al."), in the PLoS ONE, an online scientific journal ("PLoS" stands for "Public Library of Science").

Megan believes this new model of the appearance of raptors makes them much less cool, but the way in which Jill reformulates the facts to make them seem like even more vicious predators re-ignites her interest and makes the new raptors seem like at least as good a candidate for a good action thriller movie like the original version, if

not better. Thus, the phrase "the past keeps getting cooler". (Or that Megan, like Randall, has an irrational fear of raptors and is updating her knowledge of them.)

Clicking on the original cartoon links to a YouTube video of a bird of prey (in this case a secretarybird) using its wings for stability while standing on top of a struggling prey, from which one can easily envision instead a raptor upon its prey—especially in case of some kind of "raptorphobia", as for Randall (see 87: Velociraptors and 135: Substitute). Microraptor was a small raptor with four wings, which lets you imagine even scarier scenes.

The same idea is later explored from a different perspective in 1527: Humans.

#1105: License Plate
September 07, 2012

The next day: 'What? Six bank robberies!? But I just vandalized the library!' 'Nice try. They saw your plate with all the I's and I's.' 'That's impossible! I've been with my car the whole ti-- ... wait. Ok, wow, that was clever of her.'

Explanation

Cueball has obtained a new license plate. The license plate number one receives is often the next in sequence, available at the time and place of registration. However, in many localities, for an additional fee one can select their own "personalized" license plate number (called a vanity plate), subject to certain criteria, and availability.

In this comic, Cueball has elected to purchase the personalized license plate number "1I1-III1" or "one, letter I, one, dash, letter I, letter I, letter I and one". He believes the ambiguity between the letter I and the digit 1 on the plate will make it very difficult for anyone to correctly identify his vehicle if he commits a crime. Some localities have more distinct "1" and "I" characters in their license plate font than others, but often when a crime is committed witnesses only have a short time to look at the plate, and will then be confused.

In principle his idea did work, because when the police end up interviewing a witness of a crime scene in the end of the comic, he can only say that "The thief's license plate was all "1"s or something". What Cueball does not count on is that there are no other license plates made up entirely of the letter I and the digit 1. Thus, when witnesses report a vehicle with a license plate of either/or I's and 1's, the police know exactly who the perpetrator is.

Given the fact that the police still haven't caught him

even though they have his address written on a Post-it note in their car, it seems like they had already thought of the same idea, and when Cueball registered such a license plate they put up the address in the police cars, as they expected him to begin committing crimes. He may already have committed more than one, but they would soon stop him before it turned into a crime spree. (An alternative interpretation is that his crime spree has so far consisted of minor offenses, so they haven't arrested him, just issued him warnings or citations -- although one would expect him to stop once it became obvious they were onto him.)

Some individuals in New Hampshire and Kansas have obtained this license plate.

The title text appears to be a conversation between Cueball and the police the next day when they show up at his address. It turns out that the police suspect Cueball of six bank robberies. Cueball responds that "all" he did was vandalize the library. But the police disregard this as a nice try to avoid being arrested because witnesses saw a license plate with all 1's and I's was used. Cueball does not understand this because he was with his car the entire time since he got the license plate. And just as he says this, he has an epiphany and states wait. OK, wow that was clever of her. It is thus clear that he suspects that Megan of having made a false license plate also with only a combination of I's and 1's. And then she has robbed six banks knowing that the police would be sure to suspect Cueball, who was so foolish to show his criminal intent by registering such a plate in the first place.

Knowing that the police will assume the car is his, she has thus framed him. Hopefully for Cueball, he can prove he was not involved in the robberies, but if the police assumed that he was the one that committed the crimes, they may not have taken so much care in collecting evidence the first day of the crimes. This will have given Megan time to run away with all the money, as no one was looking for her. So she may well have left the country with no one looking for a woman. This will make it more difficult for Cueball to avoid the blame.

It is clear that Megan would not be so stupid as to register another plate, because then they would know that there could be more than one criminal. Also she would not have had time to get it, if the crime spree began soon after Cueball showed the plate to her. But if the fake plate makes people tell about the 1s and Is then the police would not ask further and discover that the plate might have looked fake.

Note the yellow police line seems to say Police strip do not cross, where Police line do not cross seems to be the only sentence used normally (unless it is crime scene do not cross, but that also does not fit). (Of course, this could be a pun about the fact that this occurrence is a comic strip.)

#1106: ADD

September 10, 2012
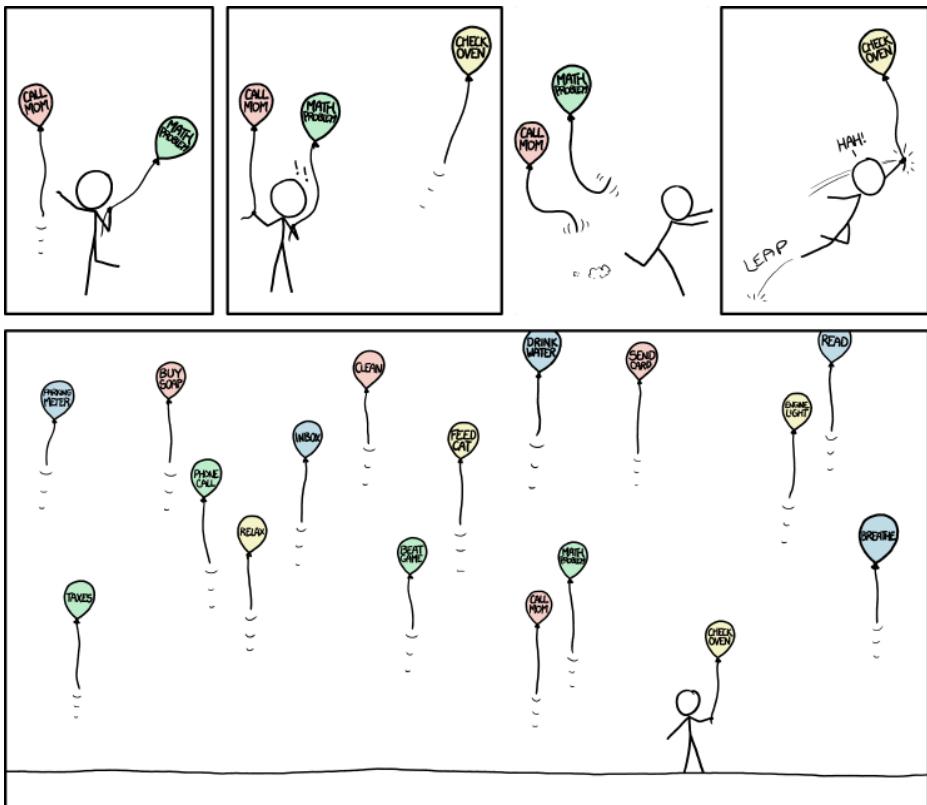
20 balloons float away while I'm busy permanently tying one to a tree to deal with it for good. Unfortunately, that one balloon was 'land a rocket on the moon in Kerbal Space Program.'

Explanation

This comic appears to be a visual representation of the thought process of someone with Attention Deficit Disorder or ADD (Which has been renamed to ADHD, for "Attention deficit hyperactivity disorder"). Various of Cueball's thoughts or tasks that he must do are represented by balloons which are rising out of his reach. He holds the "math problem" balloon and grabs the "call mom" balloon, but notices "check oven" is rising out of his reach. He abandons the two balloons he holds to dive and grab the "check oven" balloon. Of course, this allows the other two to rise, presumably out of Cueball's reach, as the pullout reveals a plethora of other balloons already rising too high, some of which describe actions required to live, like balloons marked "breathe" or "drink water". This visualizes how ADHD makes it incredibly difficult to multi-task, prioritize, and continually work on one task.

Cueball quickly drops one task to take on another, only to jump to yet another task before that one is done; showing how the person with ADHD feels; that while they are focusing on one task, 20 others are getting away from them. The title text further reinforces this, noting that while committing to actually complete one task (represented by tying a balloon to a tree), 20 others floated away. The task he chose to complete is (as stereotypical for someone with ADHD), a task that results in no necessary accomplishment — the task is to land a rocket on the moon (Mun) in Kerbal Space

Program, a PC-based spaceflight simulator and video game. Additional humor comes from the fact that landing a rocket on the moon in Kerbal Space Program would require a lot of repetition through trial-and-error, making a long and involved task during which many other important tasks might be ignored normally.

In addition, the title "add" may also have a secondary meaning that Cueball feels that balloons/tasks are always being added, which does indeed feel like the case as his field of vision expands, resulting in an overwhelming experience.

Here is a list of all of the balloons with explanations for each

#1107: Sports Cheat Sheet

September 12, 2012

I would subscribe to a Twitter feed that supplied you with one reasonable sports opinion per day, like 'The Red Sox can't make the playoffs (championship games), but in last night's game their win seriously damaged the chances of

the Yankees (longstanding rival team).'

Explanation

Randall presents a "cheat sheet" which is a handy reference guide for something that is generally expected to be memorized or known by someone familiar with the knowledge domain. Cheat sheets are commonly used in mathematical applications to list important formulas or for measurement conversions; but they may also be used in other applications.

This cheat sheet allows Randall to figure out what sport other people are arguing over on the basis of the time of year and where the argument is occurring. The chart is based on the annual seasons (periods when the top professional and college leagues play) of each sport.

In the United States, the chart is divided among baseball, basketball and American football. Hockey is not shown, suggesting that he may not consider hockey a sport to compare with the three listed, he does not encounter arguments about hockey (of the four major professional sports leagues in North America, the NHL is significantly behind the others in terms of attention as its appeal is traditionally limited by geography to Canada and the northern United States), or that he perhaps does not need a chart to determine when the argument is about hockey (they may be obvious for countless reasons, including the physicality of typical hockey confrontations). Also, golf is not shown as well implying Randall may not think it's an important sport. The chart suggests that football is the most popular of the three

sports, or at least more popular to argue about (of the four major professional sports leagues in North America, the NFL generally has the most attention).

The NFL football regular season generally runs from September to December with playoffs in January and early February. Overlapping this period of time, NCAA college football is also occurring, from September to December, with their bowl games in December and January. Almost all of this period, sports arguments are likely to be about football. The NBA basketball regular season runs from late October to mid-April with playoffs in April and into June. NCAA college basketball starts in November but peaks in March with the NCAA Basketball Tournament (March Madness). According to the chart, the arguments about basketball don't begin until the football season is over. They continue through the end of April, but start again at the end of May during the playoff finals. The MLB baseball regular season runs from April through September with playoffs in late September and October. When the baseball season begins, arguments shift from the ongoing basketball season to the new baseball season. As mentioned, the NBA Finals create some basketball arguments again for a few weeks. Similarly, the start of the NFL season in September makes it more likely arguments then will be about football. Baseball takes over briefly during the playoffs in October.

One of the punchlines is that outside the US, all sports arguments are about association football (soccer) all year round. The two types of football are noted on the chart

by an icon showing the ball used in each sport. Of course, in reality, most countries have seasonal sports besides football, which may range from cricket to ice skating. However, non-American sporting events are unlikely to be brought up in the United States, and when they do it is very often association football as its active seasons are potentially long and overlapping (being played in both hemispheres and across most latitudes).

The title text continues on the theme of this chart being for someone who doesn't know anything about sports. Randall imagines a Twitter feed where you receive a salient sports opinion each day, presumably so that you could repeat the opinion to your friends and appear knowledgeable about sports. As the feed is for those uninformed about sports, there are clarifications of important terms in brackets.

The suggested Twitter message mentioned in the title text is accurate for the date of the comic. On September 11, 2012 the baseball team Boston Red Sox played the New York Yankees and won, 4 runs to 3. The Red Sox were already mathematically eliminated from the playoffs (meaning they needed to win more games than remained in the season to qualify). The Yankees were at the top of the standings, but were in a close race for the playoffs with the Baltimore Orioles (both teams had a win-loss record of 79 wins to 62 losses, with 21 games each remaining to play). To be guaranteed a spot in the playoffs, the Yankees had to win more of their remaining games than the Orioles. Losing to the Red Sox made this task harder. (For those wondering, both the Yankees and

the Orioles made to the playoffs, but neither made it to the championship round, the World Series.)

Traditionally, the Red Sox and the Yankees have a long-standing rivalry, especially among fans. Many Red Sox fans consider a loss by the Yankees nearly as good as a win by the Red Sox (and the Red Sox beating the Yankees the best of both worlds). If the Red Sox can't win the World Series, then at least they can help prevent the Yankees from winning it.

For those with less interest in either depicted form of 'football', there are several other local or global varieties that could be discussed, as there are also other world-spanning sports that may provide a significantly seasonal or year-round interest for their adherents. From Randall's own perspective, however, they are perhaps unlikely to feature prominently enough in observed conversations to need mentioning in this simplified cheatsheet, or form the basis of useful 'opinion hints' along the lines of the baseball one. Other people, especially outside the US, could probably make use of significantly different versions (possibly still dominated by soccer, at least in the non-local scope).

This strip is one of several in which Randall attempts to trivialize sports (see for instance 904: Sports, 1480: Super Bowl, 1507: Metaball and 1859: Sports Knowledge).

#1108: Cautionary Ghost

September 14, 2012
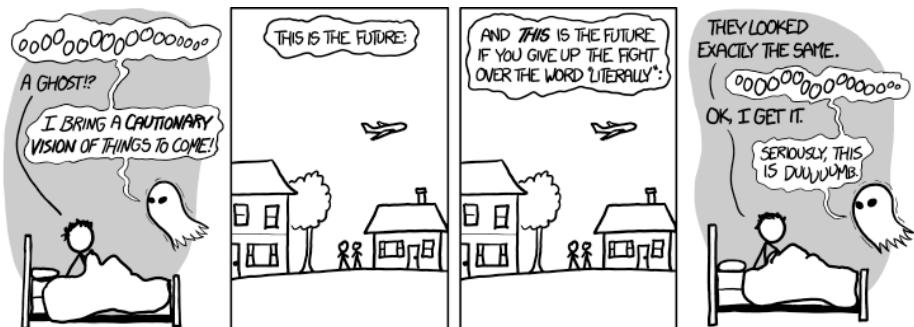
But then the Ghost of Subjunctive Past showed up and told me to stay strong on 'if it were'.

Explanation

This comic is a parody of Charles Dickens's A Christmas Carol, where Scrooge is replaced with someone who insists on calling people out on their incorrect usage of the word "literally", and speaks to the irrelevance of correcting people's speech.

In "A Christmas Carol", the ghosts of Christmas past, present, and future awaken the main character in the middle of the night to show him the negative causes and effects of his selfish and uncharitable behavior. In this comic the ghost wakes up a man who is intent on correcting people's usage of the word "literally." People often use "literally" as emphasis or exaggeration to a figurative statement, when the word's original meaning was that something had happened exactly as described. A statement such as "I literally ate 40 lbs of chocolate" might be said, when the person might have only actually eaten half a pound. A more correct statement would be "I ate a large amount of chocolate."

The ghost shows the protagonist two futures, one where he keeps correcting people, and one where he stops. That the two "different" futures are exactly (i.e., literally) the same suggests that the man's struggle to get people to stop using "literally" incorrectly will have no meaningful effect on the world, and so the man (and by extension, everyone else) may as well stop wasting time and energy on it.

Ironically, the title text indicates that a second apparition encouraged the man to continue the fight on a different grammatical issue, the use of the phrase "if it were," which is frequently incorrectly substituted with "if it was." "Were" is correctly used in a hypothetical condition, when referencing something that may not be true. The ghost of subjunctive past references the ghost of Christmas past and the 'Subjunctive past tense'. The following sentences illustrate the correct usages:

• If I were rich, I wouldn't have to work for a living.

• When I was rich, I didn't have to work for a living.

Another xkcd comic, 725: Literally, also refers to the overly mocked usage of "literally."

A similar ghost is seen in 1393: Timeghost, where it reminds Cueball about the passing of time, and 2836: A Halloween Carol similarly parodies Dickens's A Christmas Carol.

Popular Culture[edit]

The comics Cyanide & Happiness and The Oatmeal offer examples of this sort of derision.

September 17, 2012
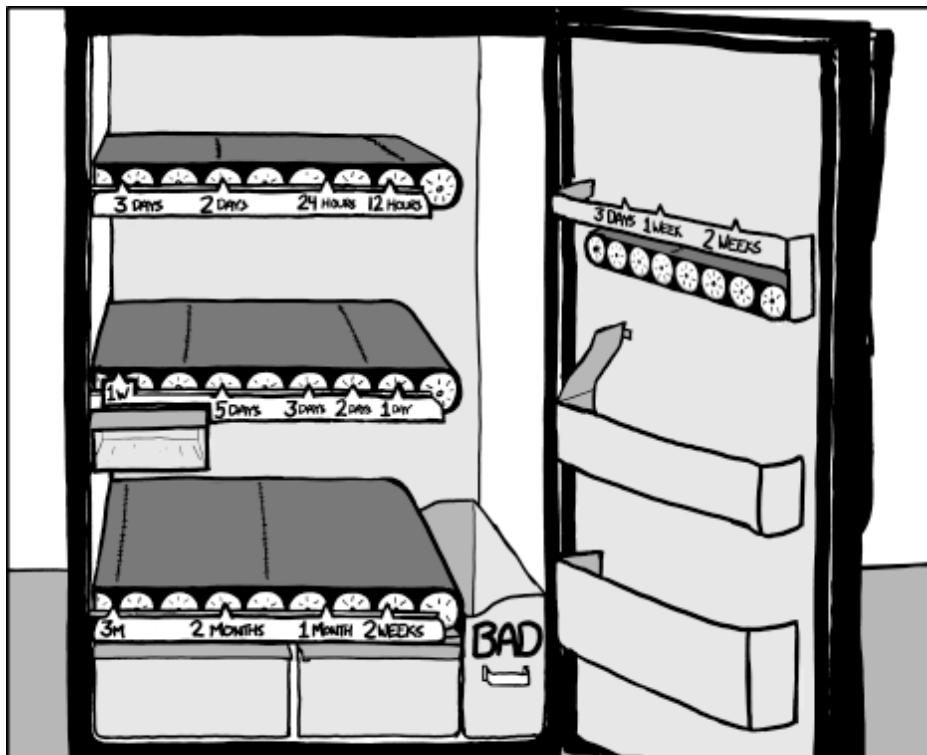
MY IDEAL FRIDGE

I want this engraved on my tombstone like the Epitaph of Stevinus.

Explanation

Randall proposes the idea of a refrigerator with conveyor belts tuned to different speeds such that food is moved along to the right (main compartment) or left (door) as time passes, with the time appropriate markings letting you know how much time is left until it spoils. When the expiry date is reached, the food will have reached the rightmost part of the refrigerator and conveniently fall into the "Bad" tray at the bottom right of the fridge.

The title text is a reference to Simon Stevin's proof of a problem of equilibrium consisting on balancing a weight on an inclined plane by another weight hanging off the top end of the inclined plane. Stevin, also known as Stevinus, had the proof inscribed on his tomb, and as such the proof is commonly known as the "Epitaph of Stevinus". Randall expresses his interest in having his own ostensibly brilliant idea likewise engraved on his own tombstone.

#1110: Click and Drag

September 19, 2012
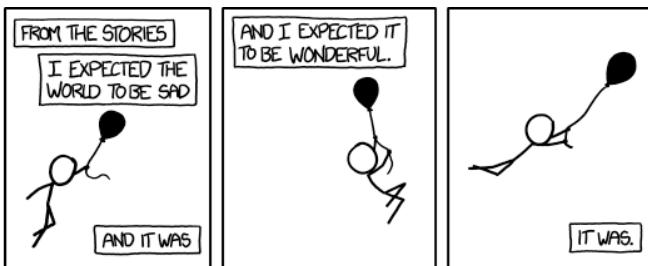
Click and drag.

Explanation

This comic is a take on how vast and rich the world is, and on the thrill of exploring it. The world can be described as sad, as well as it can be described as wonderful, even if this seems a bit contradictory, just because it is so big and there are so many different things happening in it all at once. Cueball comments about this while hanging from a balloon, which brings to mind the expanded perspective over the landscape attained by early experimenters in overland flight.

The title text is the same as the comic title, and both of these invite the reader to Click and drag the inside of the last panel, with their mouse, and by dragging, explore what is hidden outside that panel. The image displayed at first turns out to be part of a huge landscape, filled with big or small things, humorous details, people here and there, cave mazes, things floating in the air, jokes and references, unexpected things, relaxing views, etc.

The fact that we only see a small part of the landscape at once refers to the idea that we cannot in real life comprehend the whole world altogether, but only what is around us and/or in the range of our understanding at the time. The click-and-drag process, in which it is impossible to go as fast as we would want to, also draws a parallel with the fact that exploration is always done gradually, step by step, and trying something (i.e. here dragging in a certain direction) always has a cost. This click-and-drag exploration reproduces the thrill of

discovering new horizons, getting lost sometimes, finding unexpected things, seeing beauty, humor, desolation or happiness here and there... which can easily captivate an xkcd reader for a long time (and as such qualifies as nerd sniping).

In comic 1416: Pixels you zoom, by scrolling, until every pixel in this image turns into new pictures, and this can be continued again and again. Once you have zoomed in, you are able to click and drag the picture just like in this comic.

And in 1608: Hoverboard exactly the same idea is used again, but instead of dragging the image you fly/float around in the image with Cueball on a hoverboard. This gives a very different way to explore as he cannot go through walls or the earth etc. You also have to discover that there is a big world outside the initial play area; and where this comic tried to help people realize they should do something, both with the title and title text, Hoverboard directly tries to dissuade people from going outside with a warning message. Another major difference is that hoverboard is actually a game where you can collect coins (spread throughout the picture) and return them to the starting point to gain a score.

The book Thing Explainer that was the reason for the Hoverboard game, also has a direct reference to this comic, as Cueball is seen floating with his balloon outside the cockpit in the explanation for Stuff you touch to fly a sky boat. 1975: Right Click, the April Fools' day comic of 2018, has a title similar to this one, in

that it gives away how the user should begin to interact with the comic.

#1111: Premiere

September 21, 2012
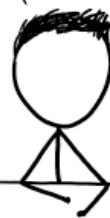
'But what's the buzz about the film?' 'We're hoping it's distracting.'

Explanation

This comic depicts an entertainment news television program. Hairy, as the news anchor, notes that "all Hollywood" is in town, meaning there are a lot of members of the film industry. The event is a movie premiere, a common place for reporters to interview celebrities, actors, and other people related to entertainment.

Megan represents the reporter at the premiere reporting for the television program. The red carpet is a tradition whereby a long red carpet is laid out leading to the entrance of a theater as a symbol of elegance. Movie stars are said to "walk the red carpet" when they arrive and do interviews and pose for photos along this carpet, most famously seen at the Oscars.

When asked the ambiguous question "How do things look?", instead of reporting on the premiere and the movie stars arriving, Megan reports on the bleak long-term outlook for the Earth as we know it. She states than in about 800 million years the Sun will become so hot that the Earth's oceans boil away. According to the Wikipedia article this will though first happen in about 1.1 billion years. But the 800 million years may have been the best estimate back in 2012 when this comic was released, see for instance this article from 2013 that states 850 million years. (The loss of oceans will still happen long before the sun turns into a red giant in about 5 billion years).

When Hairy then asks how the stars are reacting (meaning how the movie stars are reacting to this news about the oceans), Megan instead replies that the stars are reacting with hydrogen fusion, the nuclear reaction of actual stars like the Sun, thus again ostensibly mistaking the intent of the question. All astronomical stars eventually die when there is not enough hydrogen (or other heavier atoms) to continue the fusion process that keeps the stars stable.

Hairy then clarifies that he (of course) meant the movie stars, but Megan keeps being bleak in her reporting as she notes that they also won't last forever, and by the way no one else will. She is of course right as eventually everyone dies,[citation needed] just as the stars will eventually die, but of course much sooner for any living human, movie star or not. This reminding people that they will soon die is a common thing for xkcd, apart from the whole segment of comics to make one feel old, there is a specific example in 1393: Timeghost and even more so in 926: Time Vulture.

In the title text Hairy ask about the buzz about the film. The buzz here refers to ongoing discussion of the movie, analogous to a continuous humming sound. Megan exclaims that she hopes this buzz distracts people from the apparently grave news she has already reported.

Also, since "premiere" etymologically means "first", the title might be a pun on the comic number, which only consists of four ones (1111).

The joke of Megan answering a question in an interview in an unexpected manner was used again in 1302: Year in Review.

Megan had an existential crisis already in 220: Philosophy and later again in 1822: Existential Bug Reports. In the latter it was the Sun swallowing the Earth (not the oceans) that was her concern.

#1112: Think Logically

September 24, 2012
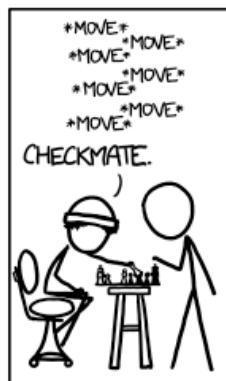
I've developed a more logical set of rules but the people on the chess community have a bunch of stupid emotional biases and won't reply to my posts.

Explanation

Chess is a millennia-old board game in which two players take turns moving one of their 16 pieces to try and checkmate the other player's king (one of the pieces). When one player can capture their opponent's king on their next move, and the opponent has no legal move available to avoid such capture, the opponent is said to be in "checkmate", and by definition immediately loses.

The game, with origins around the sixth century and the modern rules being essentially set in the late 15th century, has a significant amount of history. The rules and traditions are well established. The knight is a piece that can only move in an L-shaped pattern (two squares in one direction, and one square perpendicular), but has the unique ability to jump over other pieces.

The comic highlights two mistakes players often make in chess: complete fixation on the king at the cost of their other pieces, and failure to take advantage of the knight's movement patterns. At the same time, this is a jab at how people sometimes oversimplify an argument when confronted with a topic they are not familiar with. Previously this was depicted in 675: Revolutionary and 793: Physicists. See also the Dunning–Kruger effect. The units in chess are widely agreed to be well-balanced, and Cueball's criticism of the knight shows an obvious lack of knowledge of the knight's potential.

Given the long history of chess, a significant amount of

writing and research has been dedicated to the game and its strategies. This is inadvertently mocked by Cueball who naively suggests it would be trivial to list all situations in which a piece would move backwards (called a "retreat" in chess). Such a list — at least a partial one — certainly does exist, as do lists of numerous other chess moves and situations.

Knit Cap proceeds to demonstrate Cueball's lack of knowledge by beating him in four moves, which typically would only occur when an experienced player plays a novice. The checkmate depicted is the scholar's mate, being a classic early-game checkmate in chess. It is extremely easy to defend against it (blocking the queen's vision of f7, without letting the queen take any of your pieces, would do), thus proving Cueball's inexperience. Scrutiny of the board suggests a scholar's mate, something along these lines (using chess algebraic notation): 1.e4 e5 2. Bc4 Nc6 3. Qh5 Nf6 4. Qxf7#.

Cueball, instead of admitting he underestimated the game, believes the failure is in the game itself. The title text indicates that Cueball attempted to suggest revisions to the rules of chess. Given that Cueball has no experience as a chess player, it is likely many of the changes are illogical or ridiculous. In the face of hundreds of years of history, it is not surprising that the chess community is ignoring them. The last major changes to the rules of chess occurred more than 400 years ago when, among other things, the pawn was given its two-space starting move and the queen was made into the most powerful piece (previously it was the weakest).

The chess community's ties to the traditions of the game and their refusal to accept Cueball's suggestions are written off by Cueball as "emotional bias" suggesting his changes are logical, but that the community is letting their emotions cloud their rational decision making abilities, while in reality, it is he who is being affected. However, Cueball may feel better if he learns that lots of chess variants do exist out there.

The comic may also be a jab at competitive online games whose fans call for "buffs" (power additions) and "nerfs" (power reductions) to characters they believe to be underpowered or overpowered, often with inadequate knowledge of those characters. On the other hand, some online games and multiplayer computer games in general are unbalanced since they lack centuries of history to balance themselves, unlike chess.

Knit Cap is called knit hat guy in the official transcript. There are two other cases (after this comic) where a person with hair has been shown with a knit cap. The first was Randall's wife after chemotherapy in 1141: Two Years and the second time it was Knit Cap in 1350: Lorenz.

#1113: Killed In Action

September 26, 2012

We can't let this happen again. We need to build a secure TWO-day-before-retirement safe room.

Explanation

The comic plays with the TV and film trope of Retirony, in which a cop is killed in action only a short time before (often the day before) retirement, usually producing a sense of even greater tragedy in the timing of the death. The humor of this strip arises from the notion that, given so many policemen are killed the day before retirement, retiring cops could be sequestered in a secure facility on the day before their retirement to avoid retirony. Unfortunately this merely results in tragedy when a cop is killed the day before being sequestered.

The title text is a reference to the reactionary nature of security procedures often put in place in the aftermath of an incident, and how they typically fail to address the root cause of the problem. If the logic expressed in the title text was followed repeatedly, eventually the number of days police officers spent in the secure room would encompass their entire career. Perhaps even quicker, if combined with another expandable scheme designed to protect rookie cops from similar 'first day accidents'.

See also the paradox of the "unexpected hanging".

#1114: Metallurgy

September 28, 2012

This exotic blade was wrought from a different fallen star. The meteorite was a carbonaceous chondrite, so it's basically a lump of gravel glued into the shape of a sword. A SPACE sword!

Explanation

The comic explains how weapons would really behave if they were made out of unusual materials. In fantasy stories, using unusual materials for weapons traditionally makes the weapons more powerful and cooler despite limited explanation for exactly why materials of extraterrestrial origin are so superior to their earthly counterparts. The salesman in the comic is Beret Guy, who appears with a beard for only this comic.

The first panel is a reference to a fairly common fantasy trope: the use of iron meteorites for making weapons and armor (for example the sword "Brisingr" of the Inheritance cycle, "Anglachel" in the Tolkien Legendarium, the sword of Martin in Redwall or the panserbjørns' armor in Pullman's Northern Lights). The quality of such metal can be rather hit-and-miss. On one hand, iron from meteorites was often mixed with "terrestrial" iron in the early stages of human development to create relatively high quality steel for swords. Undeveloped metalworking techniques at the time meant that extraterrestrial metal was often more refined and plentiful than man-made metal ingots. With that in mind, however, research has shown that meteorites have an abundance of the chemical element Antimony (Sb) which by itself is a very brittle metal and therefore swords forged from metals harvested from meteorites may not be as strong as lore would have one think.

The second panel is a reference to stories set in Middle-earth where swords such as Orcrist, Glamdring or Sting (the swords of Thorin, Gandalf and Bilbo/Frodo) glow blue when Orcs are near. The dagger in question, though, glows because of the radioactive properties of Actinium (Ac) which is also highly toxic. Definitely not a dagger you would want to carry around for your every day battles.

The word "Eldritch" in the third panel means sinister, ghostly, or magical.

The fourth panel mentions that the weapon gives a +2 to a player's attribute. This is a reference to role-playing games in which it is common to find items that are able to improve one's character by increasing desirable attributes. In this case, however, +2 to cancer risk, a consequence of the dagger's radioactivity, would definitely not be considered a desirable attribute to increase. This would hit harder on Randall due to his now-wife being diagnosed with breast cancer.

In the title text, the salesman tries to sell Cueball another meteoric blade, this one made from a carbonaceous chondrite. Carbonaceous chondrites are rocky meteors that generally don't contain a lot of metallic iron. The salesman is either stating that the blade is simply a bunch of nonferrous meteor fragments glued together in the shape of a sword, or stating that the iron he got out of the meteor is so full of impurities that it may as well be gravel. However, because it's made of extraterrestrial material he seems confident he'll still be able to sell it on

novelty value alone.

#1115: Sky

October 01, 2012
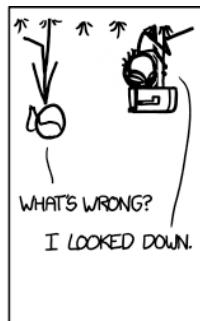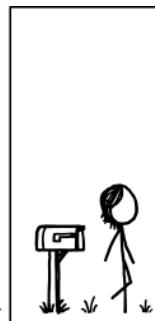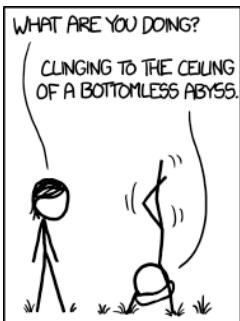
I dropped a bird and I didn't hear it hit bottom.

Explanation

This comic is about the fact that much of the way we see the world is relative. Which way is left or right, for example, depends on the direction one is facing, so different people can give different answers and both be correct. (Contrast this to absolute directions, such as East and West, which do not change based on one's orientation.)

Which way is 'down' is a little more complicated, as both the absolute and relative direction use the same word (owing to the two directions usually being the same on Earth): it can be defined as 'whichever way gravity goes / the direction things fall', but it can also be defined as 'the direction one's feet are'. In space particularly, the latter definition tends to be used as the former is rather hard to deduce. It is possible, though not too useful, to simply say that 'down' in space is 'whichever way Earth is', or perhaps even 'whichever way is opposite to the Sun'.

However, even on Earth, the direction of 'down' can get muddled. Humans rely a lot on vision to determine which way is down, so in an enclosed room with no references, one can easily convince themselves (accidentally or deliberately) that down is in a different direction to gravity. Forcing yourself to think in a different perspective changes a lot of things that are usually thought of as mundanities.

Beret Guy convinces himself that down is toward the

sky. Megan asks him why he is clinging to the ground. He responds that he is holding on to the ground so that he does not fall into the sky. Megan at first dismisses this but later looks up, gets scared and is found by Ponytail, clinging to a mailbox afraid of falling up (down?).

The title text continues this idea, where Megan "drops" a bird into the sky, and never hears it hit the "bottom". As birds can fly, and captured birds often fly away when released, its flight appeared to Megan as the bird falling upward. "Didn't hear it hit bottom" would normally mean that the pit is too deep for the sound of impact to make it back up, although in this case as the 'pit' is genuinely bottomless the bird would never hit 'bottom' even if it didn't move.

#1116: Traffic Lights

October 03, 2012
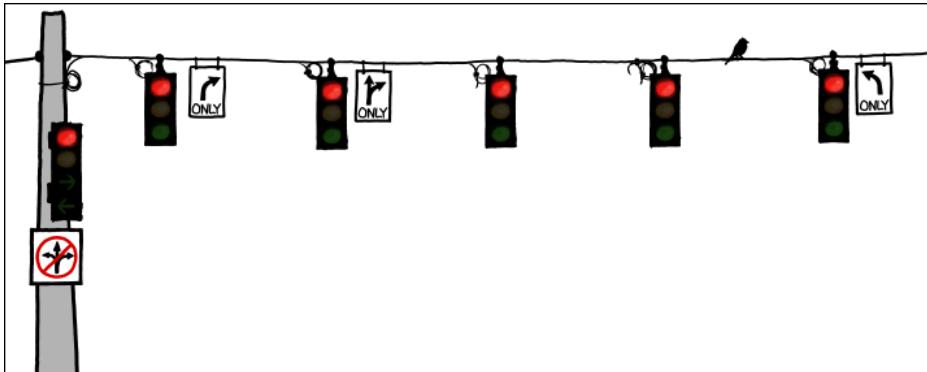
There's an intersection I drive through sometimes that has a forward green arrow, a red light, and a 'no turns' sign all on one pole. I honestly have no idea what it's telling me to do.

Explanation

This comic is an animated gif which features an array of traffic lights which are lighted signals posted at intersections to control vehicular traffic. The standard North American traffic light has three solid lights: red, yellow and green (meaning, in simplistic terms, "stop", "stop if you can, otherwise exit the intersection" and "go if it is safe" respectively). More complicated lights sometimes have additional signals such as arrows indicating go or stop for a specific direction such as left or right turns.

However, as in the strip, sometimes an intersection has multiple lights with certain of them designated to apply solely to a specific lane or specific direction of travel. A common one is a left-turn light that allows the lights to stop or allow left-turn traffic independent of the rest of the traffic. Another common example is a light that applies only to public transit like streetcars that run on tracks on the city streets. There are also other rules and features that tend to be unique to different localities as noted in the Wikipedia article for traffic-light signalling and operation. In this comic, Randall is commenting on the confusion that can be caused by having too many lights with multiple rules attached by creating an exaggerated example.

In the comic, the right light has a sign indicating that the light and the right lane are for left turners, while the 3rd-from-left is a straight or right turn lane and the 2nd

from left is right turn only. In normal course, right turns would be permitted from the right lane and left turns from the left lanes. The system in this comic would have turning traffic crossing each other, as well as the straight-ahead traffic and would cause chaos (and require very complicated traffic light phases to control). The left-most light on the post has a sign indicating that left, right and straight travel are all prohibited, which is even more confusing. The comic cycles through various phases, at first appearing somewhat normal, but then adding unusual lights and symbols.

The animated gif takes about 90 seconds to cycle through the 32 discrete panels before repeating. The title text mentions a straightforward intersection that allows going forward but not turning. Even though Randall is confused, in some places, a red light and a forward green arrow permits going forward but disallows turns.

• The left post light has (unusually) left and right arrows, later becoming up and down arrows. At times the light completely shuts off, and at other times, has conflicting signals.

• The third-from-left light has red and yellow, and later all three lights come on at the same time, then all three lights go yellow, and then reverse with green at top and red at bottom. The bottom light then becomes an arrow.

• The fourth-from-left traffic light switches from a green light to a purple light at times.

- The right light only lights red in each position.
- The second-from-left light and second-from-right lights do not appear to have any quirks other than changing phases in unusual patterns.
- At frames 21 and 22 (see below), the colors of the latter five lights correspond to the color sequence of the letters in the Google logo. Only the first letter of the logo, which is blue, is not reproduced on the first traffic light.

#1117: My Sky

October 05, 2012
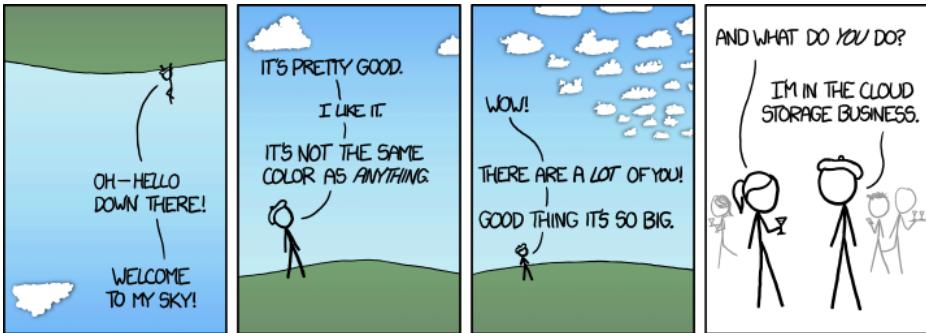
According to my mom, my first word was (looking up at the sky) 'Wow!'

Explanation

This comic seems to be a follow up to 1115: Sky.

Here, Beret Guy claims ownership of the sky, which contains or "stores" the clouds. Last panel is a pun on cloud computing and specifically cloud storage, and looks like a follow up to 1032: Networking. The obvious joke is that, instead of "cloud" (Internet-based) storage, Beret Guy's business is literally storage of clouds.

The title text is a further statement, that his first words came while looking up at the sky. This relates to the first panel, where Beret Guy is shown hanging to the grass ceiling of an upside-down panel; the joke is that from an outside perspective not only would Beret Guy appear upside-down, but so would his written-out speech. As a child, Beret Guy would be looking up at his mom, and with a similar flipping of his speech his first word "MOM" would appear as "WOW".

There are some connections with both 908: The Cloud and the title text of 1444: Cloud.

#1118: Microsoft

October 08, 2012
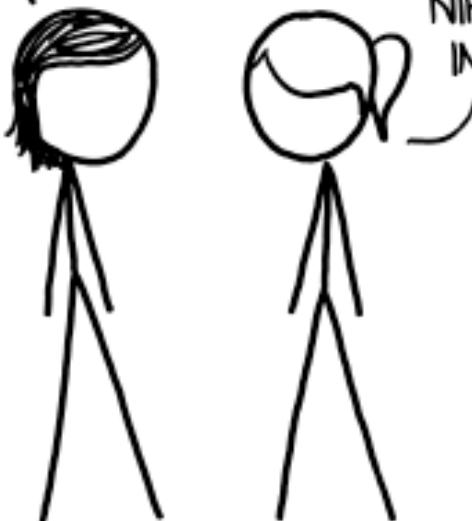
Facebook, Apple, and Google all got away with their monopolist power grabs because they don't have any 'S's in their names for critics to snarkily replace with '$'s.

Explanation

In the late 1990s Microsoft started bundling its web browser, Internet Explorer, with its Windows operating system. This effectively destroyed the Netscape company, who up until then had the most market share with its browser, Netscape Navigator. Microsoft was involved in a legal case against the U.S. government, which required Microsoft to allow IE to be uninstalled among other remedies. Removal of Internet Explorer has no clear solution as libraries and utilities associated with Internet Explorer are used across other Windows applications.

The comic sarcastically states that this stopped companies from creating a monopoly on software practices. Unfortunately, platform developers such as Apple, Sony, and Microsoft have restricted third-party software distribution over the internet via their own curated online stores in recent years, and will come full circle with the introduction of Metro Applications on the Windows 8. The comic also mocks the triviality of browser debates compared to current antitrust cases concerning privacy and price fixing.

Apple bundled a browser on both its desktop and mobile platforms. Apple also requires all iOS developers to sell their apps only through the Apple App Store, paying sizeable commissions to Apple, and Apple can refuse to sell any app. In some instances, Apple has developed its own versions of popular third-party apps.

On Android, Google bundles in a mobile version of Chrome web browser (as of version 4.0 Ice Cream Sandwich), but you are allowed to change the default browser. The company has a majority market share in web search engines, being the most popular search engine available. On Facebook, users face difficulties in accessing or removing their profiles and personal information, among other issues. Recently, this has been mitigated by the ability to download a zip file of all content ever posted to Facebook, but it still remains difficult to delete data from Facebook.

Apple has been widely criticized for trying to force all users of Mac OS or iOS to run only content approved by Apple and distributed through the Apple App Store, each sale from which gives royalty payments to Apple.

The title text refers to mocking Microsoft as Micro$oft or M$ for attempting to take too much money from consumers, and jokingly suggests that the inability to easily do this with other companies′ names (Fa¢ebook? Appl€? Goog£e?) is how they succeeded at amassing power where Micro$oft failed.

#1119: Undoing

October 10, 2012
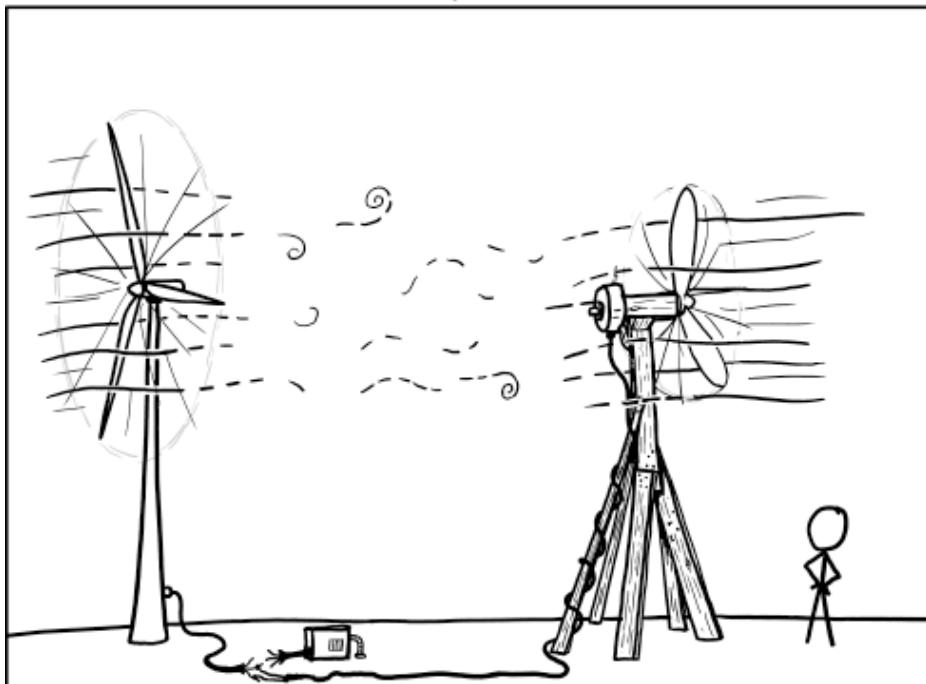
I've been sneaking out at night and installing lamps on the underside of every photovoltaic panel I can find. Sure, there are upwards of **80%** losses, but I prefer to think of them as nearly **20%** gains.

Explanation

This is another comic in the My Hobby series. It plays on how energy from natural resources (wind, sun, water) gets turned into electricity. Wind turbines convert the wind power into rotational energy, which can then be used to produce electricity. The one seen in the image is the most commonly known wind turbine, which is use on wind farms. Wind turbines provide a renewable resource for homes and cities and a common method for sustainable energy. Turbines have been referenced before in xkcd, in 556: Alternative Energy Revolution.

In this comic, Cueball has rigged it so that the wind turbine powers a fan. He cut the power cable attaching the turbine to the power grid and spliced it with the power cord of a giant fan. The nailed-together 2x4s that form the "tower" for the fan further indicate the "jury-rigged" nature of Cueball's work. The electricity generated from the wind power is then used to power the fan, which in turn produces wind. This is about the complementary nature of wind turbines and fans, which was also covered in 1378: Turbine.

The undoing part refers to how Cueball is using this fan to restore the wind that was used to turn the wind turbine back to the original wind flow, canceling out not only the turbine's electricity production, but also its slight reduction of the surrounding wind force.

Wind turbines have a theoretical limit of 59% of the

portion of wind captured. You can see the wind not captured detailed in the image as dotted, turbulent curly lines; turbulent flow. Cueball has placed the giant fan in the direction of the wind so that the wind it produces combines with the windpower not captured by the wind turbine. This is indicated by the lines smoothing like they were at the start. Thus, not only is the electrical benefit undone, but also the change in natural wind currents.

The title text explains that he performs the same undoing process with solar cells, where light energy is converted into electricity using photovoltaic cells, which is then used to power lightbulbs for producing light on the area below them that the sun would normally illuminate. Solar panels only convert 20-25% of the energy captured from the sun into electricity. However, Cueball points out that he sees this as a 20% gain rather than an 80% loss. Since it is Cueball's hobby to waste time and energy, this makes perfect sense.

Incandescent light bulbs only convert at most 5% of the electricity provided into light, the rest is lost as heat energy. Thus less than 1% of the energy absorbed from the original sunlight will be released as light from the bulb. LED bulbs can do quite a bit better, approaching 90% efficiency, and releasing around 17% of the original sunlight, though in different frequencies.

In the case of the wind turbine and fan, the wind will, unfortunately, be moving at a much slower velocity than at the start as energy was lost in converting wind power to rotation energy, then to electricity, then back to

rotational energy, then back to windpower. However, in the solar panel and lamp case, the light will be moving at the same speed as it entered the panel thanks to the constant nature of the speed of light, but be less bright instead.

#1120: Blurring the Line

October 12, 2012
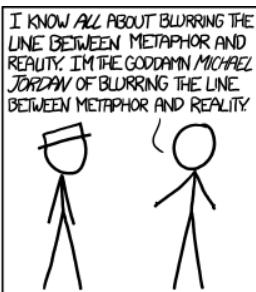
People into masturbatory navel-gazing have a lot to learn about masturbation.

Explanation

A metaphor is a comparison which may be used to emphasize, explain or embellish a point, as seen in this comic when Cueball likens himself to Michael Jordan. Michael Jordan is a famous basketball player who is well known for being one of the very best basketball players (this saying was used before in 1027: Pickup Artist).

White Hat is analyzing a movie about movies when Cueball compares White Hat's description of the movie to masturbatory navel-gazing, a comment combining two expressions used to refer to a pointless activity or effort, but also specifically self-referential activity. "Mental masturbation" and "navel gazing" are relatively common terms to dismiss work that is regarded as self-indulgent, overly introspective, and self-referential. Calling navel gazing, or introspection, "masturbatory" is a metaphor speaking of it in terms of the physical act of masturbation.

White Hat then defends the movie by saying that it is about blurring the line between metaphor and reality, commenting that Cueball doesn't understand art. To this Cueball retorts by likening his ability to meld metaphor and reality by using a metaphor comparing himself to Michael Jordan. He then proceeds to actually blur the line by throwing a basketball at White Hat. This can also be understood as another reality metaphor, passing the "conversational ball" to White Hat, or acting like Michael Jordan by playing basketball.

The last frame is also a graphic illustration of blurring the line between metaphor and reality, where a much more "real" depiction of a basketball intrudes into the colorless stick-figure world which serves as an abstraction of our shared reality.

The title text blurs the line between metaphor and reality by dragging both metaphors in the term "masturbatory navel-gazing" into reality and pointing out that literally staring at your navel is not going to be very effective at physical sexual self arousal, which is the goal of masturbation.

Another comic that blurs the line of a metaphor is 1320: Walmart.

#1121: Identity

October 15, 2012
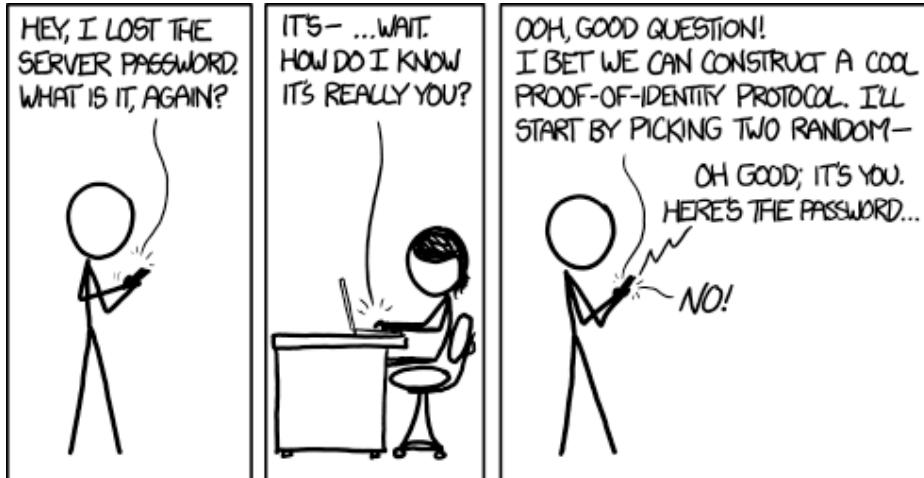
Not sure why I just taught everyone to flawlessly impersonate me to pretty much anyone I know. Just remember to constantly bring up how cool it is that birds are dinosaurs and you'll be set.

Explanation

Cueball lost the server password and is asking Megan what it is. Megan correctly comments that she can't be sure through text-based messages that it's really Cueball asking for the password; it could be someone impersonating him attempting to socially engineer access to the server. Cueball answers by starting to develop a cryptographic protocol they can use for proof of identity, probably something like OTR Messaging as implemented in many XMPP chat clients or Feige–Fiat–Shamir identification scheme. In reality, it would already be too late for that — they should have prepared something beforehand. Before he even finishes, Megan answers "It's you", meaning that no one else is so geeky that they would answer like that. Cueball, dismayed at the fact that his geekery has become a defining characteristic of his and also at a lost opportunity to devise his protocol, shouts [texts?] "NO!".

In the title text, Randall suggests that this is, in fact, his own personality, and that anyone reading the comic can now impersonate him. For a bonus, he notes his own fascination with the fact that birds are just modern dinosaurs, which one could use to impersonate him as well.

#1122: Electoral Precedent

October 17, 2012
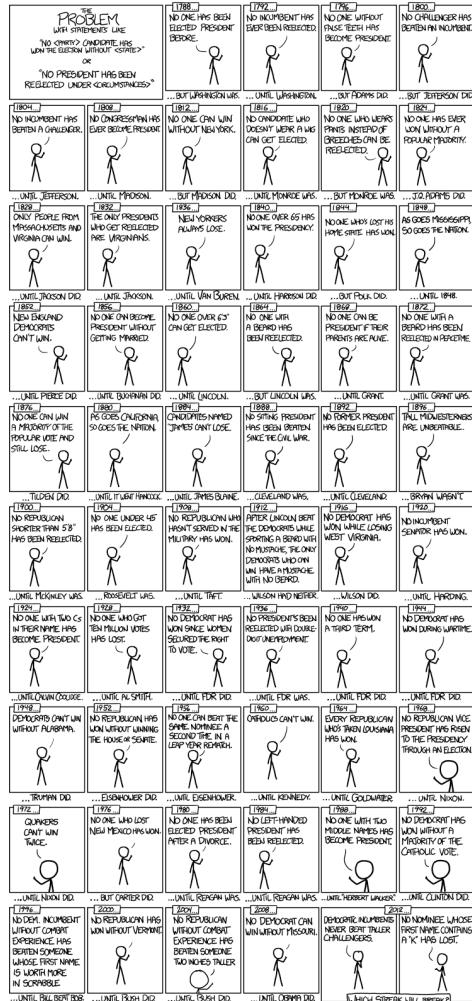
No white guy who's been mentioned on Twitter has gone on to win.

Explanation

During election season in U.S. presidential elections — and especially in election night coverage — it is common for the media to make comments like the ones set out in the first panel of this comic. Randall is demonstrating the problem with making such statements, many of which simply come down to coincidence.

After the first panel the next 56 panels in this comic refer to each one of the 56 presidential elections in U.S. history before Obama's re-election in 2012. The panels depict a pre-election commentator noting a quality or condition that has never occurred to a candidate until one of the candidates in that election broke the streak. In other words, one can always find at least one unique thing about a candidate who has gone on to win (or in some cases, lose) or the circumstances under which they won (or lost) that is unique from all previous winners (or losers). It's worth noting that some of these 'firsts' were truly precedent-setting (such as the first incumbent losing, the first president to win a third term, the first Catholic president, etc.), but the fact that they hadn't happened was no assurance that there wouldn't be a first time. As the years pass on, these 'streaks' become more and more nested and complicated, and then brought by Randall to the point of absurdity by pointing out very trivial things, such as "No Democratic incumbent without combat experience has ever beaten someone whose first name is worth more in Scrabble" (1996).

The flaw made by pundits while reporting such streaks is that there will always be something that has never happened before in an election, and they purport to suggest that these things are related to the candidate's win or loss. Randall considers this a logical flaw. A common one is, as noted in several panels, candidates can't win without winning certain states. The question, however, is one of cause or effect.

Given that there have only been 56 elections, there are always going to be things that haven't happened before. If you go out looking for them, you're sure to find some. There is no magic about why these events haven't happened. In most cases, it is merely a coincidence.

In the last two panels, two more statements like the previous are given. They were both true before the election in 2012 on November the 6th. The comic came out in the middle of the campaign on October the 17th. The statements were constructed so that the first predicts that Obama can't win over Mitt Romney, and the second that he cannot lose. As Obama won the election he thus ended the streak Democratic incumbents never beat taller challengers whereas the other streak is still valid.

The title text refers to the fact that Twitter was founded in 2006. Obama won in 2008, so at the time of the comic it was true that no white male person mentioned on Twitter had ever gone on to win the presidency; although certainly some former presidents, all of whom were white males, have subsequently been mentioned on Twitter. This streak was broken in the next election year

when Donald Trump won the 2016 election.

During these last four weeks before the election, Randall posted no fewer than four comics related to this election. The others are: 1127: Congress, 1130: Poll Watching and 1131: Math.

In 2020, Randall posted an update to this comic: 2383: Electoral Precedent 2020.

Table of Broken Precedents[edit]

#1123: The Universal Label

October 19, 2012

INGREDIENTS: HYDROGEN, TIME

Works for any grocery or non-grocery. Even thyme is just **H** and time.

Explanation

All matter in the universe (heavier than lithium-7) was created through nuclear fusion of hydrogen atoms inside stars over the 13.8 billion years that have gone by since the Big Bang. A detailed explanation (for the lay person) of this process is available in this article about Making Atoms.

From this article (and from the wiki article on Big Bang) it is clear that our universe began not only with hydrogen. Although the majority of atoms produced by the Big Bang were hydrogen, lots of helium and traces of lithium were also produced. Actually about 25% of the non-dark mass in the universe comes from helium created shortly after the Big Bang. (See also the later comic 2723: Outdated Periodic Table about which atoms were around after the Big Bang).

In stars, however, helium is also created directly from hydrogen atoms. So it would have been enough to just start out with hydrogen in the early universe. Given enough time, all the other elements would have been created inside these originally hydrogen-only stars. To make elements heavier than helium some of the elements created by hydrogen, will have to fuse subsequentially. And in order to make elements heavier than iron, a supernova explosion is needed. But in either case it is still products of hydrogen that fuse together.

In many countries, food products must have their

ingredients displayed somewhere on their packaging. Because all the ingredients in any food are either hydrogen or heavier atoms created through stellar nuclear fusion from hydrogen over time, the ingredients of any items can technically be described fully as only being made from hydrogen and time. Thus this label would be the universal label. A pun on two of the meanings of the word universal. Any food is of course universal as in a part of the universe. But the label can also be a universal label as in a common label for all food or any other product in the universe, as well as the universe itself for that matter.

The title text first makes it clear that this works both for any grocery as well as any non-grocery, which as described above simply means anything else. It then goes on to making a pun on the words thyme (a herb) and time, as the two words are homophones. "H" is the chemical symbol for hydrogen thus completing the pun by noticing that the word "thyme" can be made by adding the letter "h" to "tyme" which would be a homophone even closer to the word time.

Randall previously made a joke on the fact that thyme and time are homophones in 282: Organic Fuel.

Later he made a reference to primordial hydrogen in the title text of 2778: Cuisine.

#1124: Law of Drama

October 22, 2012
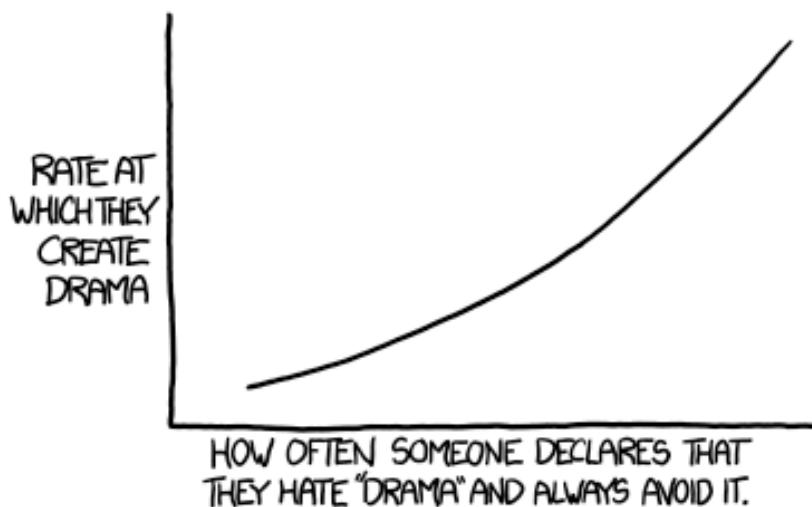
'Drama' is just 'people being upset', when someone says they're always surrounded by drama and they just ignore it, it starts to make sense that their strategy might be backfiring.

Explanation

The comic comments on how often people who label themselves as an innocent party in a debate are often far from it. Essentially, Randall seems to be graphically stating that people who claim to hate and want to avoid drama are invariably associated with it. Since correlation does not imply causation, it might be a leap — at least scientifically speaking — to actually surmise that they're the cause of it. The fact that merely postulating a rule without telling if the creator of the rule is causing or avoiding drama didn't cause much drama in this wiki might be a (albeit weak) clue that the claim might actually be correct.

The title text suggests that the person's attitude towards drama is wrong. Supposing that "'Drama' is just 'people being upset'", then ignoring drama is a very bad way to deal with it. By ignoring people's problems, you certainly won't be able to help them, and are at risk of causing further problems through ignorance.

#1125: Objects In Mirror

October 24, 2012

Universes in mirror, like those in windshield, are larger than they appear.

Explanation

"Objects in mirror are closer than they appear" is a required, although marginally ridiculous, "safety warning" required to be engraved on passenger side mirrors of motor vehicles in the USA, Canada and Korea. These mirrors in these countries are typically the only ones that are slightly convex, making objects appear smaller (and farther away) than their true size. Other countries often have convexity in driver-side and passenger-side rearview mirrors to give a larger field of view, at the cost of natural distance proportions of the mirror image, without making any statements about it on the mirror itself using engravings.

This comic is a reference to the phenomenon known as redshift/blueshift. Due to the Doppler effect, objects that are moving toward an observer appear bluer than they actually are (known as blueshift). Objects moving away from the observer (e.g. objects viewed in the rear-view mirror of a moving vehicle) appear redder than they actually are (known as redshift), and thus the objects are in reality bluer than they appear. This is generally relevant only in terms of high speed motion such as observation of the expansion of the universe in astrophysics. The joke is that the relative speed of any object visible in a side-view mirror would create an insignificant and unobservable redshift.

Another possible explanation is that the redshift refers to the actual reflection itself. As photons are reflected in a

mirror, momentum is transferred and thereby they lose a very small amount of energy. This loss of energy results in a slight redshift of the light. (This effect is similar to compton scattering.)

Edwin Hubble was an astronomer credited (amid some controversy) with "Hubble's Law," which states that a Doppler shift can be observed for objects in deep space moving with relative velocity to Earth and that their velocity is proportional to their distance from Earth. Probably the most famous application of the law was measurement of relative velocities of galaxies, such as those seen in the picture known as Hubble Deep Field, taken by the Hubble Space Telescope. The results proved that most galaxies keep getting farther apart as a result of expansion of the universe. This is one of many pieces of evidence supporting the Big Bang theory.

The title text references that we see the universe as it was in the past (due to the distances involved and the speed of light), when it was smaller than it is today. It may also be a reference to comic 1110: Click and Drag.

#1126: Epsilon and Zeta

October 26, 2012

The average error in the **NHC** forecasted position of a hurricane three days in the future has shrunk to a third of what it was in **1990**--a staggering accomplishment. However, as you may have gathered, forecasts of future

storm *strength* have proved more difficult to improve.

Explanation

The Atlantic hurricane season normally runs from June to November. Randall is imagining the situation in the National Hurricane Center when the 2005 season was extended more than a month by the appearance of Hurricane Epsilon and Tropical Storm Zeta. He imagines the situation as NOAA meteorologists watch with amazement (and increasing annoyance as they were presumably unable to move off to other things such as post-season analysis) as Hurricane Epsilon and Zeta continued to exist far beyond the normal end-of-season date (November 30).

The monospaced text in most of the panels is material taken from actual NHC reports from that season. The commentary has been edited to fit the comic's format, but it's otherwise faithful to the actual reports. While the only change to Forecaster 1 is when he's celebrating New Year's Eve, Forecaster 2 is visibly losing it after the appearance of Zeta in late December, with unkempt hair and an unshaven beard.

The last report of the 2005 season was issued on January 6, 2006.

A full analysis of the 2005 hurricane season can be found here.

NHC reports on Epsilon and Zeta:

• 10 AM EST TUE NOV 29 2005 (Panel 1)

- 10 PM EST WED NOV 30 2005 (Panel 2a)
- 4 PM EST THU DEC 01 2005 (Panel 2b)
- 4 AM EST FRI DEC 02 2005 (Panel 3a)
- 10 AM EST FRI DEC 02 2005 (Panel 3b)
- 4 PM EST SAT DEC 03 2005 (Panel 4)
- 10 PM EST SAT DEC 03 2005 (Panel 5a)
- 4 AM EST SUN DEC 04 2005 (Panel 5b)
- 10 AM EST SUN DEC 04 2005 (Panel 6,7)
- 4 PM EST MON DEC 05 2005 (Panel 8)
- 10 PM EST MON DEC 05 2005 (Panel 9)
- 4 AM EST TUE DEC 06 2005 (Panel 10)
- 10 PM EST TUE DEC 06 2005 (Panel 11a)
- 4 AM EST WED DEC 07 2005 (Panel 11b)
- 10 AM EST THU DEC 08 2005 (Panel 12)
- NOON EST FRI DEC 30 2005 (Panel 14)
- 4 PM EST FRI DEC 30 2005 (Panel 15)
- 10 PM EST SAT DEC 31 2005 (Panel 16)
- 10 PM EST SUN JAN 01 2006 (Panel 17)
- 4 AM EST MON JAN 02 2006 (Panel 18a)
- 4 PM EST MON JAN 02 2006 (Panel 18b)
- 10 PM EST MON JAN 02 2006 (Panel 19a)
- 10 AM EST WED JAN 04 2006 (Panel 19b)
- 4 AM EST THU JAN 05 2006 (Panel 20)
- 10 AM EST THU JAN 05 2006 (Panel 21)

- 10 PM EST THU JAN 05 2006 (Panel 22)
- 4 PM EST FRI JAN 06 2006 (Panel 23)

Randall has discussed the seemingly erratic nature of hurricanes before. This may, however, have been a response to the recent Hurricane Sandy.

The text also seems to be a parody of horror stories/movies, and their theme of writing.

#1127: Congress

October 29, 2012
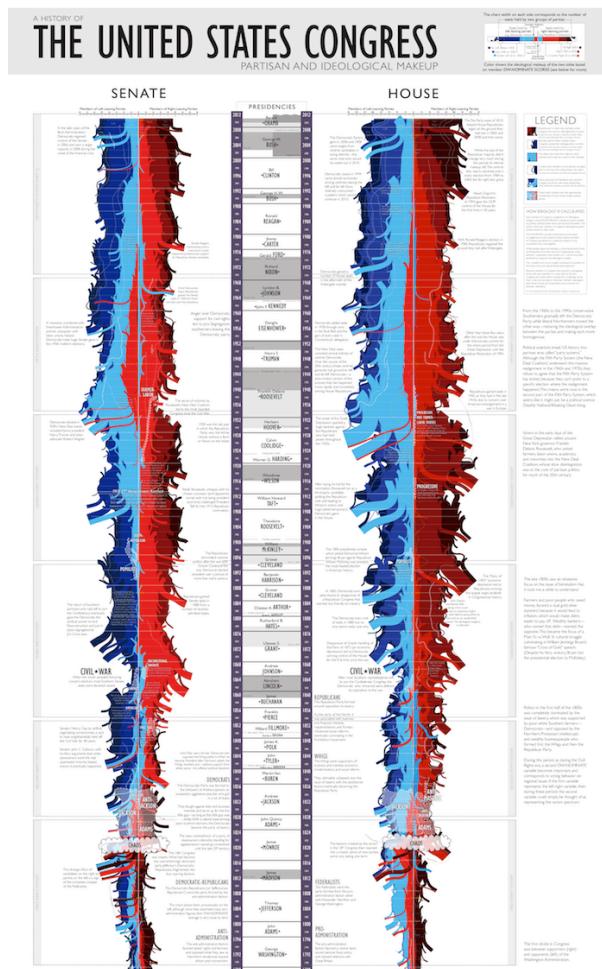
It'd be great if some news network started featuring partisan hack talking heads who were all Federalists and Jacksonians, just to see how long it took us to catch on.

Explanation

It appears that the (at the time) upcoming 2012 election has put Randall into a political state of mind, as this is the second comic in a few weeks that has dealt with political history (1122: Electoral Precedent). As with that comic, this comic goes through the entire history of the U.S. Federal Government. Also notably, Randall makes a number of observations that are akin to the type of observations Randall denounces in 1122 (e.g. for 1928, Randall notes that no Republican has since won the presidency without a Nixon or a Bush on the ticket). Just around the election he posted two more comics related to this: 1130: Poll Watching and 1131: Math.

U.S. Federal Government[edit]

In the U.S. Federal Government, one of the checks and balances is a bicameral United States Congress, which consists of two "houses": the Senate, its "upper" house; and the House of Representatives ("the House"), its "lower house". The Senate consists of 2 senators elected from each state (thus 100 total), while the House consists of 435 voting representatives (a number decided upon in 1911 by law) whose apportionment is split between the states proportional to their population; although each state gets at least one (the House also has non-voting representatives from non-state territories like Puerto Rico and the District of Columbia). Every ten years, the House is reapportioned based on the latest census. The most populous state as of 2012 is California which has 53 seats in the House. Senators serve 6-year terms with elections held every 2 years for

one-third of the seats. Members of the House (called Representatives or Congressmen/women) serve 2-year terms with all of the seats contested every 2 years.

In order for a bill to become a law, it must be passed by both the House and the Senate. In a way, this theoretically ensures that the bill is supported both by the majority of states (the Senate), and the majority of the population (the House). The President may then sign the bill into law, he may "veto" the bill, or he may do nothing, in which case it becomes a law if and only if Congress is in session after a waiting period of 10 days (not including Sundays).

Political ideologies[edit]

In politics, there is a scale that represents the political beliefs of a politician. The scale goes from "left" to "right" of "center" — which generally describes a balancing point of beliefs (sometimes called "left-wing" or "right-wing").

The "left" is a general belief in social justice, and is sometimes associated with socialism. Modern left-wingers generally prioritize equality, and support policies like welfare and government-subsidized healthcare. This trends toward having a larger federal government. In the U.S., "liberal" is a term often used to denote left-leaning tendencies.

The "right" generally believe in personal responsibility and individual liberty, which is often termed conservative. This trends towards having less regulation and thereby a smaller federal government. The goal is to keep the nation stable, and reducing the interference by the government with a person's wealth. This ostensibly means lower taxes, because the government does not

provide as much.

Politicians typically align themselves into groups of similar beliefs and positions called "parties". In the U.S., there have generally been two dominant parties, although there have been times where three or more parties have shared roughly equal influence and support. In today's politics (which is apparently known as (the second part of) the fifth era of political parties, or Fifth Party System, as noted on the outside edges of the comic) of the two current primary U.S. political parties, the Democrats are the left-leaning party, and the Republicans are the right-leaning party. The dominant parties are generally considered "moderate" in their left- or right-wing leanings, as either party appears to requires the support of a majority (or a few percent under) of voters to win. However, this is complicated by a process called gerrymandering where election boundaries are redrawn to allow a political advantage to the party currently in power. Thus a popular majority state wide or any ratio of votes to representatives will not necessarily be reflected in delegates awarded, an example being the Republicans' REDMAP 2012 report (). Smaller parties often run candidates with more extreme views, but such candidates rarely win, due to a more limited number of possible supporters ensuring that even a relatively large minority would have zero chance of representation. (see Duverger's law).

The comic[edit]

The comic effectively consists of three separate charts: The left- and right-hand charts are the main charts; they represent the Senate and House respectively, and purport to show the left- and right-wing leanings of each legislature through U.S. history. There is a legend on the right that sets out fairly clearly how the charts

work, but basically Randall has split each wing into three levels including the very moderate or "Center" right or left, and the more extreme or "Far" right or left, as well as the average left and right without prefix. A dotted yellow line represents the balance of power in each legislature, and white lines represent the leanings of certain notable people including presidents.

Some presidents are not indicated, because they were never senators or congressmen (most of these were state Governors, such as Clinton, Bush and 2012 candidate Mitt Romney). As may be noted from the chart, Barack Obama is considered "left" while Paul Ryan is considered "far right". It's also notable that the "center right" ideology appears to be completely eradicated from the House and is waning in the Senate (although a similar trend is shown around 1900 with the centrists making a comeback thereafter).

On either side of these charts, there are descriptions or explanations for expansions and contractions of each ideological group.

The center chart appears to primarily act as a timeline. Each president is listed with their leanings indicated by a left or right arrow. Wars are shaded in grey. Other notable events are also indicated. On either side of the center chart (although somewhat mixed in with the aforementioned Senate/House explanations), there are also references to the primary parties of each era showing how they evolved (left-leaning parties on the left, and right-leaning parties on the right).

Finally, there's a little extra commentary on the right side, below the legend.

The title text[edit]

The title text refers to two political parties in American history: the Federalists and the Jacksonians.

Note that this means the two parties are not strictly contemporaries. There are features of both the modern Republican and Democratic parties in each, so depending on the topic presented, it may take a long time to figure out that they are not these modern parties until the topic of discussion changes. They do, however, make a nice dichotomy.

The Federalists are one of the oldest political parties in American History. Federalists were seen as conservative in their time, and similarly to modern Republicans much of their support came from bankers and businessmen and they were committed to a fiscally sound and government, but on the flip side they favored a strong central government, regulation of industry, a national banking system, and were protectionistic.

The Jacksonian party is one of the four branches of the Democratic Party that developed during the political chaos after the Federalist party died out in the War of 1812. The Jacksonians were considered liberal for their time, they believed in one man, one vote, regardless of standing, and their mascot was a donkey and they're the ancestors of the modern Democratic Party, but on the flip side they did not want a strong national government and believed that the government should have limited impact in the regulation of industry, going so far as to end the bank of the United States, and were fiercely expansionistic.

Network news channels regularly feature talking heads, supposed 'experts' who offer their opinion on the topical political stories.

Where these talking heads are strongly aligned with a particular party, and are unconcerned with anything other than winning, they could be described as a partisan hacks.

#1128: Fifty Shades

October 31, 2012

Wishbone and the Illustrated Classics series have gotten me through every conversation I've ever had about Dickens, Treasure Island, The Anarchist's Cookbook, and Our Bodies, Ourselves.

Explanation

Fifty Shades of Grey is a best-selling novel featuring large quantities of BDSM sex. Wishbone was a children's TV show about a dog who draws parallels between literature and real life in his dreams, reenacting many literary classics. The show was especially praised in its time for refusing to censor the more unpleasant aspects of its source work. Many people within Randall's age group have experienced more literary classics through Wishbone than by actually reading them; this phenomenon lead to the formation of a Facebook group (now replaced by a page) with over 70,000 members dedicated to that idea.

In the comic, Cueball claims to have learned all that he knows about Fifty Shades of Grey from the Wishbone adaptation of the book. Knowing the faithful nature of Wishbone's adaptations, an episode on the book would likely involve age-inappropriate material for children, as the sounds emanating from the TV would suggest.

In the title text:

- Great Illustrated Classics is a series of easy to read adaptations of literary classics, including works by Charles Dickens and Stevenson's Treasure Island.
- The Anarchist Cookbook, first published in 1971, is a book that contains instructions for the manufacture of explosives, rudimentary telecommunications phreaking devices, and other items. It was written by William

Powell to protest United States involvement in the Vietnam War.

- Our Bodies, Ourselves is a book about women's health and sexuality produced by the nonprofit organization Our Bodies Ourselves (originally called the Boston Women's Health Book Collective). First published in 1971, it contains information related to many aspects of women's health and sexuality, including menopause, birth control, childbirth, sexual health, sexual orientation, gender identity, mental health and general well-being.

Part of the title text joke is that the latter two works would not likely be the subject of Great Illustrated Classics or Wishbone. However, the title text may be actually technically 100% correct, if Randall hasn't ever had an in-depth conversation about either of the latter two works.

The book was later made into a film which was referenced in 1585: Similarities almost three years later.

#1129: Cell Number

November 02, 2012

YOUR SEVEN RANDOM DIGITS

(☐☐☐) ☐☐☐-☐☐☐☐
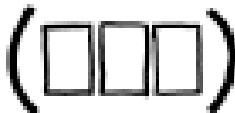
WHERE YOU LIVED IN 2005

STRUCTURE OF A US
CELL PHONE NUMBER

There's also a +1 sometimes, which is there to keep everyone on their toes. In the future, people who got to pick cool numbers by signing up for Google Voice early will be revered as wizards.

Explanation

This comic references the pattern for US telephone numbers, which are ten digits in length. Unlike in other countries, there is no quick way to determine whether that number is for a land-line or mobile customer. In either case, the first three digits are referred to as the "area code", a term dating back to before the proliferation of mobile phones, when specific codes were assigned to geographic regions. The next three digits had some rules based on the telephone exchange but as Randall says, those and the final four numbers are essentially meaningless.

In the early days of the mobile era, the geography-based numbering still applied to new mobile lines, so mobile phones would have the same area code as owners' home numbers. Late in 2003, US telephone service providers were required to support "number portability", meaning that customers could theoretically take their mobile phone number with them to a new provider, even when moving to a distant new location. In the early days this wasn't always very easy to do, but became commonplace within a couple years. Since most users opt to keep their numbers constant whenever possible, numbers generally stopped changing after about 2005, instead of shifting when people moved like they were forced to in previous years. Therefore, examination of a given phone number will likely tell you where its owner was living at that time, since their number would not have changed after 2005 due to the portability law.

"+1" is the international call prefix for the North American Numbering Plan.

Google Voice is an alternate voice over IP service. Upon signing up, users can choose any available new 10-digit number without regard to geographic area. Among other things, this allows the earlier users to choose "cool numbers" if desired, such as ones that correspond to phonewords or have a pleasing pattern. In the past, this "vanity numbering" was typically only available to businesses via toll-free numbers. Some mobile service providers began allowing similar customization after the portability law, but often still restricted new numbers by area code, keeping the availability of "cool numbers" low until Google Voice launched.

#1130: Poll Watching

November 05, 2012

The choices we make Tuesday could have MASSIVE and PERMANENT effects on the charts on Nate Silver's blog!

Explanation

This is a comic about the 2012 U.S. presidential election, as it was posted the day before the election on November 6, 2012 ("this Tuesday"). It is the third comic on the subject, the previous two being 1122: Electoral Precedent and 1127: Congress. And the next comic 1131: Math continues the issue raised in this one. In the comic, Cueball is glued to his laptop reading media coverage of the election. The offscreen character remarks that Cueball should take a break, suggesting that Cueball has been reading media coverage for quite a while.

Cueball is so caught up in media coverage that he is speculating on the effect that incumbent President Obama winning the election (and the resulting news coverage) could have on challenger Mitt Romney's campaign. The joke is that the end-goal of Romney's campaign is to win the election. If Obama wins, the campaigning is already over, regardless of media coverage. Cueball is simply so invested that he overanalyzes potential scenarios and fails to see the big picture.

Specifically, he has become so concerned with following the polls that he's lost sight of their purpose as a predictive tool. After the election is over, polling becomes trivial since the result they are intended to forecast is already known (and so in reality will not be conducted at all). This is possibly intended as a rebuke to those pundits (talking heads) who seemingly care more about (or whose jobs are contingent on caring more

about) the "game" of analyzing and predicting the politics of the race rather than caring about the actual policies the candidates are likely to pursue after coming into office. Polls and pundits are also referenced in the next comic, 1131: Math, published the day after the election.

The title text repeats this theme with Nate Silver, an American statistician, psephologist, and writer (among other things). He had a political blog called FiveThirtyEight which was originally written under a pseudonym. The Blog and its associated website primarily discuss tracking polls in respect to elections. Thus, the choices made on Tuesday (election day) will have massive and permanent effects on FiveThirtyEight's charts, which will obviously change to reflect the actual votes cast — but all the charts will have become trivial since the purpose of the blog is to predict the results. This is a parody of the bold statements often made during campaigns, such as that the choices made on election day could have massive and permanent effects on such things as your health care, the economy, your job, etc.

#1131: Math

November 07, 2012
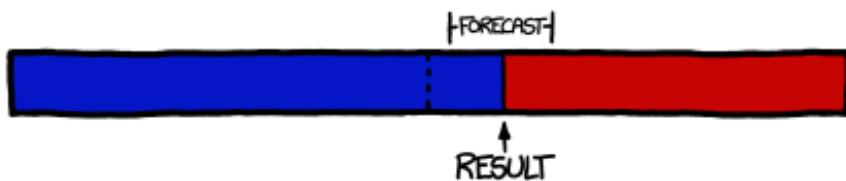
BREAKING: TO SURPRISE OF PUNDITS, NUMBERS CONTINUE TO BE BEST SYSTEM FOR DETERMINING WHICH OF TWO THINGS IS LARGER.

As of this writing, the only thing that's 'razor-thin' or 'too close to call' is the gap between the consensus poll forecast and the result.

Explanation

In another election-themed comic (this one posted the day after the 2012 U.S. presidential election November 7, 2012)—(see also 1122: Electoral Precedent, 500: Election, 1127: Congress, and 1130: Poll Watching)—this comic shows a bar graph representing expected (see note below) electoral college votes in the election, including a dotted line indicating the 270 electoral votes needed to win, a span of projections ("Forecast"), and the actual result.

The forecast range is to the right of the 270 line, showing that the blue candidate Obama (the Democratic candidate is the blue candidate and the Republican candidate is the red candidate according to a convention used since the 2000 election) was always projected to win by statisticians like Nate Silver and others. The only question among these people was by how much he was going to win. (The Electoral College votes are expectations until each state's voting results are announced early in November, and the electors actually vote in December and may change the situation somewhat.) Randall is attempting to use this particular election to imply that polling data accurately indicates the likely outcome of a presidential election. However, the close match between prediction and result in this one election could be a coincidence; the outcome of U.S. presidential elections frequently differs from projections. Notably, in 1948, the Chicago Tribune printed a headline which turned out to be false and in 2016,

polling data indicated that Clinton would defeat Trump.

By contrast, most of the media was calling the election too close to call, with some news outlets actually projecting a Mitt Romney win. Essentially the large number of Republican pundits who helped increase the pressures of right wing self-referencing media denial, the tendency of media to give any issue at least two dramatically or fictionally equal voices (for supposed "fairness") regardless of the relative merits of the two sides, and the desire to present the election as a suspenseful "horse race" resulted in a lot of talking heads (i.e. pundits) disbelieving the polls. These factors shaped the "too close to call" narrative, leading to the punch line of this story:

You don't need to believe in science or statistics for it to effectively describe or predict reality. The progressively more radicalized elements of this era are known for disregarding scientific or statistical consensus which reflects reality but does not conform to their world view. However, many of them were correct in their belief (in defiance of statistical data to the contrary) that Donald Trump would be elected in 2016.

For those unfamiliar with the US Presidential electoral process: Unlike other political offices, the election for president is not a direct election. Instead, each state is apportioned a certain number of "Electoral College" votes based on the number of House of Representatives seats (which is based on population) and Senate seats. For the most part (and there is perennial discussion on

whether this should be changed) the candidate that receives the most popular votes in a given state receives all the Electoral College votes for that state. With 538 electoral votes total, receiving 270 Electoral College votes ((half of 538) + 1) is sufficient to be declared president-elect. For this reason, sometimes one candidate actually receive more popular votes (more people voted for the candidate) but have fewer Electoral College votes. This happened three times in the nineteenth century with elections of John Quincy Adams in 1824, Rutherford B. Hayes in 1876 and Benjamin Harrison in 1888. Then it did not happen again until the election of George W. Bush in 2000 and Donald Trump in 2016.

The title text is a subversion of what everyone else was saying at that time: that the election was unpredictable. Pundits often declare events to be "too close to call" when poll results are remarkably close; Randall is saying that the only thing that is "too close to call" is the difference between the results and the predicted results, as the outcome is all but certain.

#1132: Frequentists vs. Bayesians

November 09, 2012

'Detector! What would the Bayesian statistician say if I asked him whether the--' [roll] 'I AM A NEUTRINO DETECTOR, NOT A LABYRINTH GUARD. SERIOUSLY, DID YOUR BRAIN FALL OUT?' [roll] '... yes.'

Explanation

This comic is a joke about jumping to conclusions based on a simplistic understanding of probability. The "base rate fallacy" is a mistake where an unlikely explanation is dismissed, even though the alternative is even less likely. In the comic, a device tests for the (highly unlikely) event that the sun has exploded. A degree of random error is introduced, by rolling two dice and lying if the result is double sixes. Double sixes are unlikely (1 in 36, or about 3% likely), so the statistician on the left dismisses it. The statistician on the right has (we assume) correctly reasoned that the sun exploding is far more unlikely, and so is willing to stake money on his interpretation.

The labels given to the two statisticians, in their panels and in the comic's title, are not particularly fair or accurate, a fact which Randall has acknowledged:

The "frequentist" statistician is applying the common standard of "p<0.05". In a scientific study, a result is presumed to provide strong evidence if, given that the null hypothesis, a default position that the observations are unrelated (in this case, that the sun has not gone nova), there would be less than a 5% chance of observing a result as extreme. (The null hypothesis was also referenced in 892: Null Hypothesis.)

Since the likelihood of rolling double sixes is below this 5% threshold, the "frequentist" decides (by this rule of thumb) to accept the detector's output as correct. The

"Bayesian" statistician has, instead, applied at least a small measure of probabilistic reasoning (Bayesian inference) to determine that the unlikeliness of the detector lying is greatly outweighed by the unlikeliness of the sun exploding. Therefore, he concludes that the sun has not exploded and the detector is lying.

A real statistician (frequentist or Bayesian) would probably demand a lower p-value before concluding that a test shows the Sun has exploded; physicists tend to use 5 sigma, or about 1 in 3.5 million, as the standard before declaring major results, like discovering new particles. This would be equivalent to rolling between eight and nine dice and getting all sixes, although this is still not "very good" compared to the actual expected likelihood of the Sun spontaneously going nova, as discussed below.

The line, "Bet you $50 it hasn't", is a reference to the approach of a leading Bayesian scholar, Bruno de Finetti, who made extensive use of bets in his examples and thought experiments. See Coherence (philosophical gambling strategy) for more information on his work. In this case, however, the bet is also a joke because we would all be dead if the sun exploded. If the Bayesian wins the bet, he gets money, and if he loses, they'll both be dead before money can be paid. This underlines the absurdity of the premise and emphasizes the need to consider context when examining probability.

It is also possible that the use of the sun is a reference to Laplace's Sunrise problem.

The title text refers to a classic series of logic puzzles known as Knights and Knaves, where there are two guards in front of two exit doors, one of which is real and the other leads to death. One guard is a liar and the other tells the truth. The visitor doesn't know which is which, and is allowed to ask one question to one guard. The solution is to ask either guard what the other one would say is the real exit, then choose the opposite. Two such guards were featured in the 1986 Jim Henson movie Labyrinth, hence the mention of "A LABYRINTH GUARD" here. A labyrinth was also mentioned in 246: Labyrinth Puzzle.

Further a less serious mathematical exploration[edit]

As mentioned, this is an instance of the base rate fallacy. If we treat the "truth or lie" setup as simply modelling an inaccurate test, then it is also specifically an illustration of the false positive paradox: A test that is rarely wrong, but which tests for an event that is even rarer, will be more often wrong than right when it says that the event has occurred.

The test, in this case, is a neutrino detector. It relies on the fact that neutrinos can pass through the earth, so a neutrino detector would detect neutrinos from the sun at all times, day and night. The detector is stated to give false results ("lie") 1/36th of the time.

There is no record of any star ever spontaneously exploding—they always show signs of deterioration long before their explosion—so the probability is near zero. For the sake of a number, though, consider that the sun's estimated lifespan is 10

billion years. Let's say the test is run every hour, twelve hours a day (at night time). This gives us a probability of the Sun exploding at one in 4.38×1013. Assuming this detector is otherwise reliable, when the detector reports a solar explosion, there are two possibilities:

Clearly the sun exploding is not the most likely option. Indeed, Bayes' theorem can be used to find the probability that the Sun has exploded, given a result of "yes" and the prior probability given above:

#1133: Up Goer Five

November 12, 2012
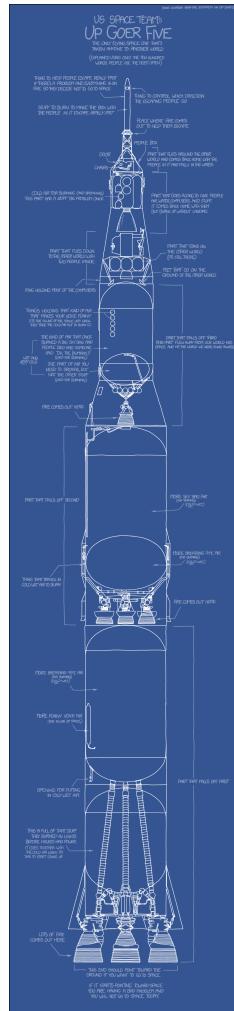
Another thing that is a bad problem is if you're flying toward space and the parts start to fall off your space car in the wrong order. If that happens, it means you won't go to space today, or maybe ever.

Explanation

This comic is an illustration that will later be used in Randall's book 'Thing Explainer', where he took it upon himself to explain a number of things, including the Saturn V rocket shown here, using only the one thousand most commonly-used words in the English language.

This comic is a diagram of the Saturn V rocket. "Saturn" isn't a very common word apparently, and neither is rocket, so Randall decided to use "Up Goer" which is a fair approximation of a craft designed to lift a payload from the earth to space, although perhaps 'thing that goes up fast' may or may not be simpler. The Saturn V vehicle, which was in use by NASA from 1967 to 1972, is the vehicle as a whole. The engines of the Saturn V (the part that makes it go up) were divided into three stages. The first stage (S-IC) had five F-1 engines which burned refined kerosene mixed with oxygen as its fuel. That stage burned for 2 minutes 48 seconds and pushed the whole thing up about 61 kilometers (~38 miles) into the sky. After it fell away the S-II stage was activated. It used 5 J-2 engines in the same configuration as the F-1s, and burned liquid hydrogen mixed with liquid oxygen for 6 minutes 35 seconds pushing the astronauts up to 184 kilometers (114.5 miles). The third stage (S-IVB) was a single J-2 engine burning liquid hydrogen and liquid oxygen. This stage was used in two parts, the first was to put the spacecraft into a stable orbit around Earth to perform a systems check and make sure the craft will be safe for

going to the moon. This would usually take three orbits around Earth. As they came around the Earth they would burn the second part of the fuel, which is called a trans-lunar injection which put them on course for the moon. The first burn took 2 minutes 45 seconds, which put them in orbit 185 kilometers (115 miles) high.

It was first used as the launch vehicle for the Apollo 4 mission, and it was used as the launch vehicle for most of the subsequent Apollo missions (the exceptions being Apollo 5, Apollo 7, Skylab 2-4, and the Apollo-Soyuz Test Project missions, which were launched using the smaller Saturn IB launch vehicle). One of the last missions of this design was the unmanned launch of Skylab, the U.S.'s first space station; for this payloader configuration, the Saturn V launch vehicle was officially designated the Saturn INT-21.

The Service Module (SM) Oxygen tanks have a note that states "This part had a VERY big problem once". This is a reference to the Apollo 13 mission. 55 hours after launch, mission control requested the oxygen tanks contents be stirred to get an accurate reading of its contents. There was a large bang, and power fluctuated throughout the craft. NASA had to scramble to ensure the safe return of the astronauts. Needless to say, the moon landing for that mission was canceled.

The Hindenburg disaster is referenced in the text "The kind of air that once burned a big sky bag and people died and someone said "oh, the [humans]!". The term "big sky bag" is used as the closest approximation of

zeppelin which is a big bag filled with a lighter-than-air gas which makes the whole contraption float. The phrase "oh, the [humans]" is a workaround of the simple-words rule, technically containing only the word humans, while being read "concentration of humans" or "humanity". The Hindenburg on the day of the disaster was filled with hydrogen, despite being initially designed for use with helium. Helium cannot catch fire as it is a noble gas and thus completely inert, but helium was unavailable due to a US export ban on the element. The risks seemed acceptable at the time because the Germans had a history of flying hydrogen-based passenger airships. The original quote is "Oh, the humanity!" (See this video about the Hindenburg disaster - the quote appears at 0:47). In the book Thing Explainer in the explanation for The pieces everything is made of (i.e. the Periodic table) hydrogen is again "named" by using a picture of the burning Hindenburg and also this quote is said by Cueball standing next to the square with the element with his hands over his mouth. See more below regarding the book.

The bottom tank, which Randall describes as "...full of that stuff they burned in lights before houses had power" is highly refined kerosene, called RP-1, it is similar to jet fuel, burns well and is not likely to explode; unlike liquid hydrogen, which is much more likely to explode.

Earlier flirts with simple words can be found in 547: Simple and 722: Computer Problems. The use of simple words was revisited again in 1436: Orb Hammer and 1322: Winter.

The comic is based on NASA-MSFC 10M04574 produced at Marshal Space Flight Center. Randall omitted the "S". The image was for sale as a poster from up-ship.com which Randal mentioned. A different scan is downloadable from Heroic Relics.

The phrase "You will not go to space today" has become something of a catchphrase for xkcd — variants of it recur in the title text of images in four What If? articles:

- Building a jetpack out of AK-47s and converting the potential energy. Machine Gun Jetpack
- The one about flying on other planets (the pilot does not want to go to space today.) Interplanetary Cessna
- Launching into Earth orbit (if your rocket cannot hit the right "horizontal" speed, you will go to space today, and then you will quickly come back.) Orbital Speed
- The Pyramid of Giza (the energy that made it is not nearly enough to launch a rocket into space; the title text has another reference to the comic, noting that the tip of the pyramid should point towards space.) Pyramid Energy

Randall has in 2015 written an entire book with this type of simplified language blueprints. Thing Explainer was published by Houghton Mifflin Harcourt on November 24, 2015 and actually had a copy of this comic in it. On the day of the book's release Randall also released a comic with a game, to celebrate the book: 1608: Hoverboard. In this game the space capsule used for landing back on earth is shown, thus both referencing the book and this

comic. This part of the space ship can also be seen in the book above the Sky toucher and the moon landing is also depicted in Worlds around the sun. When the book was released Randall had Minute Physics do a "commercial" version of this comic.

The news about the upcoming release of the book was sent out on the Blag in May as New book: Thing Explainer. After that, the book was advertised at the top of the xkcd page with link to the Blag article and links to Preorder at Amazon, Barnes & Noble, Indie Bound, and Hudson. Also, there were two other news with links: "In other news, Space Weird Thing is delightful, and I feel surprisingly invested in @xkcdbracket's results." (The link was removed sometimes before Monday the 10th of August 2015. within two weeks of the brackets final result was revealed.)

The song Space Weird Thing is a tribute to David Bowie's Space Oddity rewritten in the simple language used in this comic, which is also attributed in the text about the YouTube video. The other news item is related to 1529: Bracket, see that comic for more details.

#1134: Logic Boat

November 14, 2012
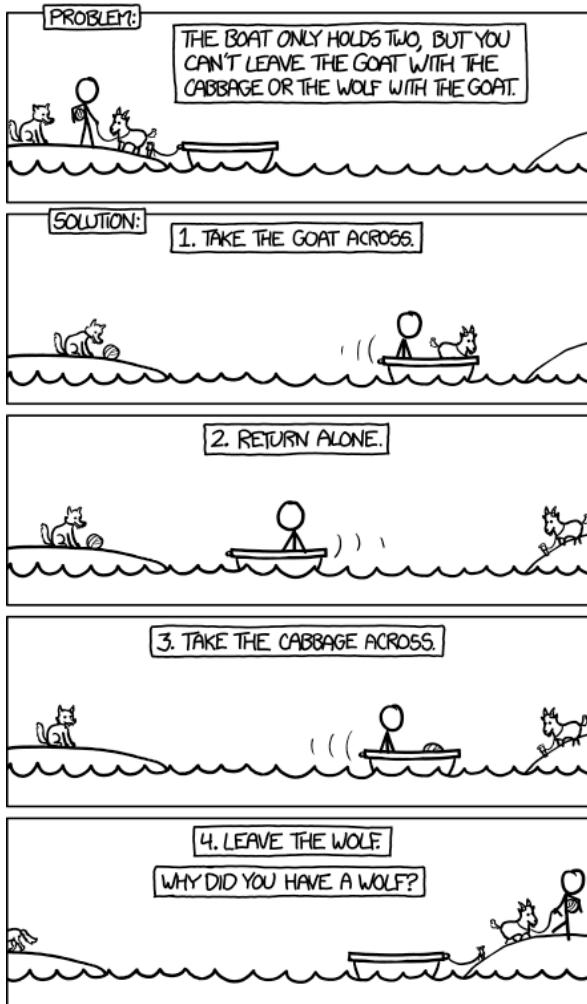
Or a cabbage, for that matter. The goat makes sense. Goats are fine.

Explanation

The comic is a play on the classic wolf, goat and cabbage problem belonging to the river crossing puzzles, and first known from Propositiones ad Acuendos Juvenes, with the same setting as here. The three possessions change between various retellings but it typically involves a carnivorous animal (wolf, lion etc.), a herbivore (goat, sheep, chicken, goose etc.), and some plant based food (cabbage, grain, beans etc.). The objective is to ferry all three possessions to the other side of a river safely in a small boat, with the limitation of only being able to transport one possession per crossing. The crossing order must take into account that the carnivore would eat the herbivore if left alone together, and the herbivore would eat the food.

The traditional solution would be:

(C - Cueball

W - Wolf

A - Cabbage

G - Goat)

(Note that, since the conditions for this problem are symmetric, an alternate solution would be to transport the wolf on Trip 3 and the cabbage on Trip 5.)

By leaving the wolf behind, four steps are saved — the comic's "step 4" is just a comment — and the troublesome wolf, a wild and dangerous animal not

usually kept by humans, is eliminated from the picture.

This could be seen a jab on the common assumption that logic puzzles only have one correct solution. Thus one often keeps the other person thinking and guessing until they arrive at the pre-defined solution, no matter how many other creative good solutions they come up with. Also note that the "problem" given doesn't even state an objective, just three prerequisites.

Alternatively, this could be a jab at the fact that the conditions of some puzzles are very strange. Both the fourth step and title text are evidence of this - questioning why you would have a wolf or a cabbage respectively. Yet, even though it is unlikely that you would ever find yourself in the situation and odd rules as stated by the puzzle in real life,[citation needed] the puzzle demands that you solve it and reach the criteria it asks.

The title text says that cabbages are also unnecessary, but goats are fine. The reasons for these opinions are less obvious than the one about the wolf, but still understandable. Many people, presumably including the narrator, do not like the taste of cabbage. Many are also fond of goats, finding them cute. The same opinion about goats is in 1282: Monty Hall. (Goat milk and goat meat are also edible.)

The river crossing puzzle was the main focus of 2348: Boat Puzzle. It was referenced in 589: Designated Drivers and 2684: Road Space Comparison.

#1135: Arachnoneurology

November 16, 2012
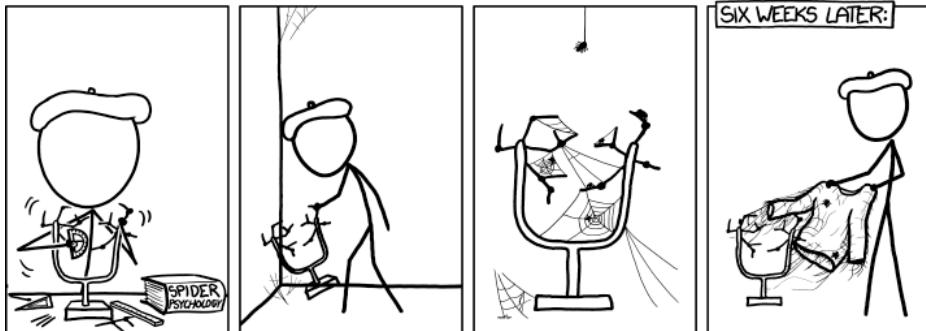
SPIDER PSYCHOLOGY (21st Ed.) is a comprehensive overview of arachnoneurology, neuro-arachnology, forensic arachnology, neuro-arachnoneurology (the study of the brains of spider neurology experts), and arachnoarachnology (the study of too many spiders).

Explanation

Beret Guy uses spider psychology (that he has obviously learned from the heavy volume of a book lying on the table with that title) to engineer a forked object in such a way that spiders will weave a silk shirt around it. After six weeks he can take the finished shirt off the "rack", and after optionally removing some stray spiders it should be ready for use.

Usually extracting spider silk is a complicated process and getting enough to weave a shirt would take very long and be very expensive. But making such an impossible project work is a typical behavioral pattern for Beret Guy, who continues to do amazing things with animals and other things from nature.

The prefix arachno- means "(related to) spiders". Arachnology, for example, is the scientific study of spiders. Neurology is a branch of medicine dealing with disorders of the nervous system, which includes the brain. So the title of the comic can be translated into the scientific study of spider brains.

The title text mentions the book lying on the table, giving not only the title and the edition (21st) but also summing up some more (non-existent and increasingly far-fetched) fields of science related to spiders, which may as well exist if spider psychology has such a big standard work. Apart from adding the word forensic in one case, all five fields come from combining only the

same two words "arachno" and "neuro" (sometimes one of them more than once) and ending any combination with "-ology". Especially funny is the neuro-arachnoneurology, which is explained to be the field where it is the brains of the scientist who study spiders brains, that are examined. The last one seems to be related to arachnophobia, the fear of spiders, as arachnoarachnology is spiders with spiders on top - i.e. too many spiders.

Arachnophobia seems to be a problem for Randall himself, according to the what if? Spiders vs. the Sun. In this he links to an article about a factory that was covered in plenty enough spider web silk to make shirts for a whole regiment of soldiers.

This is the first comic with special mentioning of a science related directly to spiders. The next was 1747: Spider Paleontology.

#1136: Broken Mirror

November 19, 2012
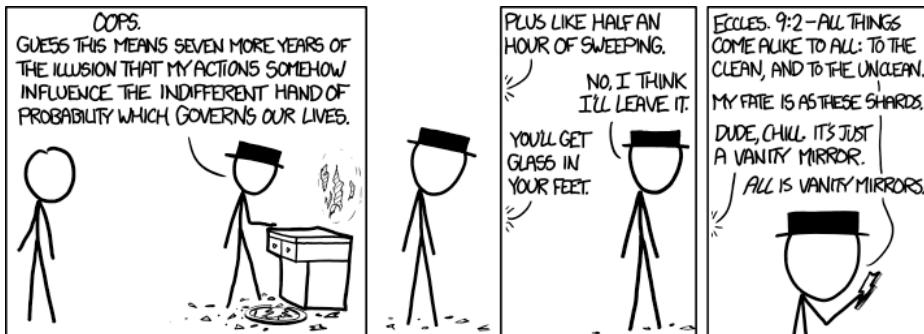
'I see you're in this mood again.' 'I am always in this mood.'

Explanation

It is a common superstition that breaking a mirror will result in 7 years of bad luck. Black Hat mocks the superstition, claiming that all is random, but ultimately cause the superstition to become true as his nihilistic apathy prevents him believing that cleaning the glass on the floor will have a significant impact. The joke is that Black Hat will likely get glass in his feet as long as he refuses to clean it, and thus the broken mirror will have a lasting impact.

Black Hat breaks a mirror and sarcastically claims that it will bring bad luck for 7 years, implying that the broken mirror will have no impact on his life. After Cueball reminds Black Hat that the broken mirror will at least cause him to clean up the glass. Black Hat responds with a quote from Ecclesiastes that explains "being clean" (doing good) or "being unclean" (doing bad) things does not affect whether good or bad things happen to us. Due to Black Hat's interpretation of Ecclesiastes, he is not going to clean the shards, and thus be "unclean", and feels nihilistically that this will not significantly alter his life. Of course, it will have an impact as he will get glass in his feet if he does not clean it.

Black Hat continues saying that "My fate is as these shards", mirroring another quote from Ecclesiastes "For what happens to the sons of men also happens to animals". Cueball tries to cheer up Black Hat by reminding him that life is not that bad, "it's just a vanity

mirror". (A "vanity" is a North American synonym for a "dressing table".) Black Hat responds, "All is vanity mirrors". "All is vanity" is another quote from Ecclesiastes; this line is repeated throughout the book and refers to impermanence of man and his creations. As the mirror just broke, its impermanence is apparent.

It is possible that this is a reference to the now-defunct webcomic Men in Hats and its character Aram, specifically in this page. Aram has been described as the inspiration for Black Hat in 29: Hitler.

In the title text Cueball says "I see you're in this mood again" to which Black Hat responds, "I am always in this mood". This is a reference to Black Hat being a nihilist in his other appearances.

Breaking mirrors is also mentioned in 2447: Hammer Incident.

Ecclesiastes[edit]

The rejection of the idea that good things happen to good people, and therefore the rejections of concepts like karma, is one of the primary tenets of the Abrahamic faiths. The argument goes that if people deserve what happens to them, then they don't deserve help. This, and the pursuit of justice (fairness, and truth) are the core beliefs that prescribe that each person has an individual responsibility to help others, so that justice can be achieved. Since Black Hat is by no means charitable, this belief clearly never took root.

• Ecclesiastes 9:2, All things come alike to all: One event happens

to the righteous and the wicked; To the good, the clean, and the unclean; To him who sacrifices and him who does not sacrifice. As is the good, so is the sinner; He who takes an oath as he who fears an oath.

- Ecclesiastes 1:2, "Vanity of vanities," says the Preacher; "Vanity of vanities, all is vanity."

- Ecclesiastes 1:14, I have seen all the works that are done under the sun; and indeed, all is vanity and grasping for the wind.

- Ecclesiastes 2:17, Therefore I hated life because the work that was done under the sun was distressing to me, for all is vanity and grasping for the wind.

- Ecclesiastes 3:19, For what happens to the sons of men also happens to animals; one thing befalls them: as one dies, so dies the other. Surely, they all have one breath; man has no advantage over animals, for all is vanity.

#1137: LTR

November 21, 2012

Collaborative editing can quickly become a textual rap battle fought with increasingly convoluted invocations of U+202a to U+202e.

Explanation

U+202e is a Unicode control character that changes all subsequent text to right-to-left (RTL, as the title references). In the comic, Black Hat tires of Cueball's complaining and inserts a U+202e character in the middle of Cueball's speech, turning his complaints into gibberish - sentences that must be read from right-to-left.

The title of the comic builds on this theme, with the title of the webpage it is hosted on being LTR in some browsers (see trivia), the reverse of the comic name.

What Cueball actually tries to say after Black Hat's change is:

When multiple writers work on the same text, arguments can often arise with some writers resorting to vandalizing the works of other writers. The title text takes this up a level, suggesting the use of U+202e and other direction control characters in editor wars to disrupt other people's work.

If you ever get involved in such a war, note that U+202a returns text back to its normal direction.

#1138: Heatmap

November 23, 2012
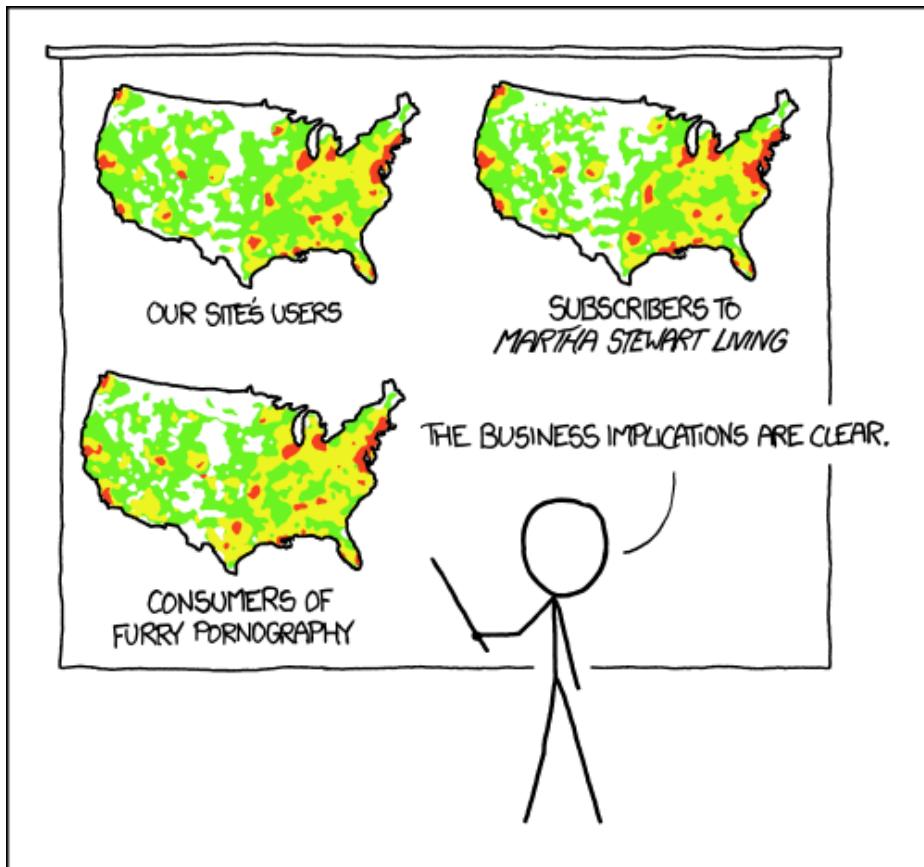
PET PEEVE #208:
GEOGRAPHIC PROFILE MAPS WHICH ARE
BASICALLY JUST POPULATION MAPS

There are also a lot of global versions of this map showing traffic to English-language websites which are indistinguishable from maps of the location of internet users who are native English speakers.

Explanation

Another of Randall's many Pet Peeves, this time on maps. This one has also been numbered #208, like the first comic on the subject 238: Pet Peeve #114.

In the comic, Cueball compares three heatmaps, showing the location of "our site's users," "subscribers to Martha Stewart Living" and "consumers of furry pornography." The three maps are nearly identical, leading Cueball to come to the conclusion that his site's userbase largely consists of fans of Martha Stewart and furry porn, and that the audience (presumably the owners/operators of the website) should adjust their content or advertising to cater to these demographics. However, Cueball's analysis is faulty; the actual reason the maps are the same is they all match the population concentration in the U.S., not because there is any statistically-significant relation between geographic location and any of the mentioned sub-populations.

A heatmap is a graph showing three-dimensional data on a two-dimensional image, with each pixel's color representing the value of the data at that position. It does not necessarily have anything to do with heat, but a heatmap may resemble a thermal image. In this comic, red represents the highest numerical values, then yellow and green, with white the lowest values, in all three maps.

The title text reflects a similar situation in world maps where the website written in English is read by

English-speaking users no matter the location, because their ISP and search providers direct them primarily to English websites, so the visitors′ geographic graph matches the graph of the global English-speaking population.

#1139: Rubber and Glue

November 26, 2012
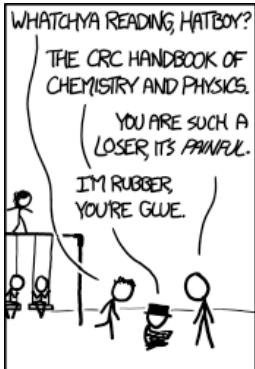
I'm rubber. You're rubber. We contemplate the reality of our existence in mute, vulcanized horror.

Explanation

"I'm rubber, you're glue; whatever you say bounces off me and sticks to you" is a school-ground retort used by children to suggest that one's insults are being ignored by the intended recipient of the insult and counter that the insult rather refers to the insulter. On a deeper level, it may imply that a person insulting others is an indication of their own insecurity and weakness.

In this comic, a young Black Hat is reading a chemistry and physics handbook, which leads to a literal and graphic visualization of the phrase. He uses the retort to frighten the children bullying him (young versions of Hairy and Cueball). Black Hat takes the traditional saying and twists it into a creepy thought by saying that they are both literally glue and rubber and that they are permanently stuck together, which scares Hairy and Cueball and prompts one of them (probably Hairy) to call for their mother.

The book is the CRC Handbook of Chemistry and Physics. It is also nicknamed the 'Rubber Bible' or the 'Rubber Book', as CRC originally stood for "Chemical Rubber Company".

The title text says that I (meaning him) and you (Hairy and Cueball, although it could possibly be the reader) are both rubber. Rubber is not a living object, so it is stuck in "vulcanized horror" in the position it was sculpted in. This could be a reference to how powerless we are in the

changing of the world. Alternatively, "I" could be Randall, and "you" could be the reader.

Additionally, two pieces of suitably treated vulcanized rubber, e.g. in applying a puncture-repair patch as part of dealing with a damaged bicycle inner-tube, will form molecular cross-bonds and ensure strong bonding between the two original items that has an integrity comparable to that of the original undamaged tubing. As a threat, it implies forcible conjoining, an existential threat to the target's individuality.

Young Black Hat also taunts young Hairy later in 1753: Thumb War.

#1140: Calendar of Meaningful Dates

November 28, 2012

In months other than September, the 11th is mentioned substantially less often than any other date. It's been that way since long before 9/11 and I have no idea why.

Explanation

The calendar used in the comic is the standard Gregorian calendar of 2012 used by most of Western Civilization. The comic looks at the frequencies of which dates appear in English writings indexed in the Google Books Library Project, by using the Google Ngram Viewer (link).

Some dates are more (or less) frequently mentioned because they have a special significance. Other dates have correlations for which there doesn't appear to be any obvious reasons. September 11th has also been the date of two significant battles in the War of 1812 (long before it gained notoriety from the 2001 terrorist attacks), particularly one where the British landed in George Washington's own plantation, which likely bolstered its search volume. Yet the significance of the globally significant terrorism incident probably accounts for most of the occurrences, since that time.

The date mentioned in the sub-heading (October 17th) is Randall's birthday.

The title text mystery is explained here. In summary, many occurrences of "11th" in the writings were actually misread by the Google Books Library Project's optical character recognition software and/or reCAPTCHA users, becoming one of these: IIth, Ilth, iith, lith, llth, 1lth, 1ith, l1th, nth.

Date Significance[edit]

The first of each month is generally more mentioned than others, perhaps because such dates are markers of a new month and may be used as landmark dates or deadlines. Similarly, the final day of each month is commonly a deadline day. Other dates have a less mundane significance, for example:

- January 1 is New Year's Day.
- February 14 is Valentine's Day.
- February 29 only exists during leap years.
- March 15 is the Ides of March.
- March 21 is considered the first day of spring, by a common convention in the northern hemisphere.
- April 1 is April Fools' Day.
- April 15 is US Individual Income Tax return filing day.
- May 1 is International Workers' Day, or May Day.
- June 4 is the June Fourth Incident of the 1989 Tiananmen Square protests.
- June 30 is the end of the fiscal year for most American states and local governments.
- July 1 is Canada Day.
- July 4 is US Independence Day.
- September 11 is the date of the 2001 terrorist attacks in New York City and Washington, DC. It's the largest number by a big margin, most likely because unlike the other dates it has no special name, it's referred to as "9/11" (or "September 11") almost exclusively.
- December 7 is the date of the 1941 attack on Pearl Harbor.

- December 25 is Christmas.
- December 31 is New Year's Eve.

#1141: Two Years

November 30, 2012
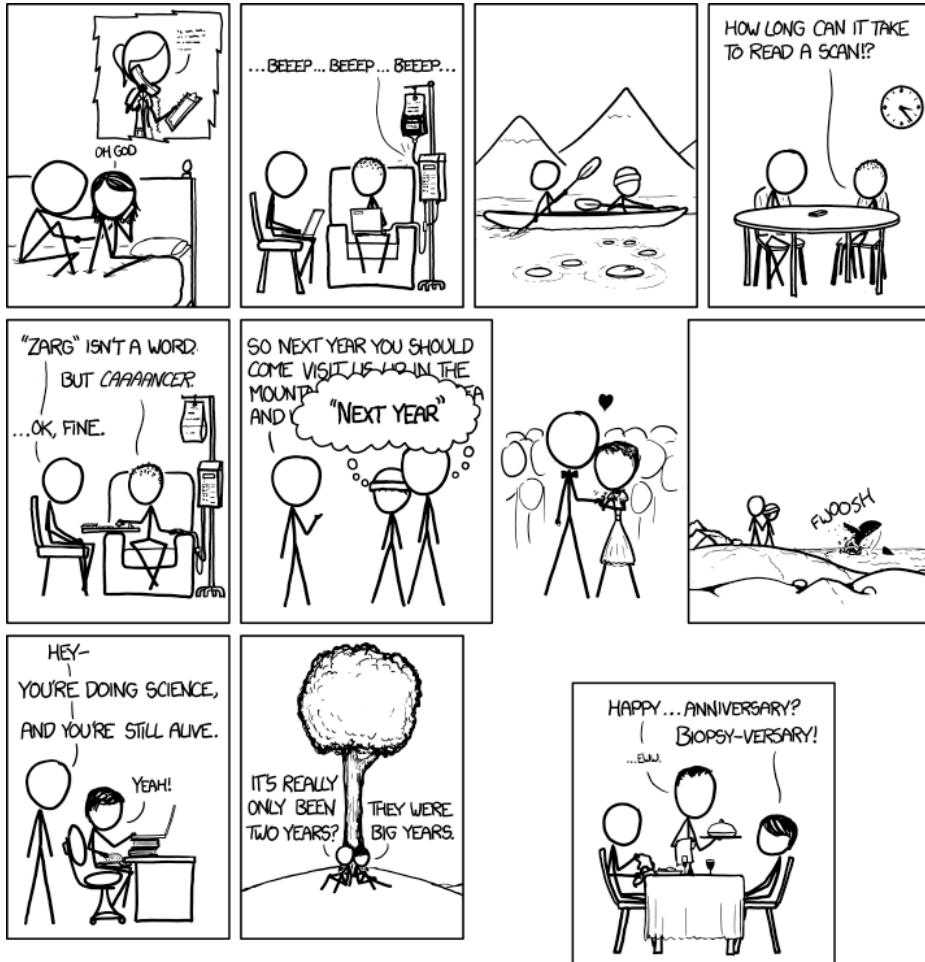
She won the first half of all our chemo Scrabble games,
but then her IV drugs started kicking in and I *dominated*.

Explanation

This comic marks the second year of Randall Munroe's wife's battle with cancer, and appears to depict actual events from those two years. Randall is depicted as Cueball and his wife as Megan, as usual for both.

This comic later became part of a series of comics directly continued in 1928: Seven Years and later continued in 2386: Ten Years. The first eight panels of this comic are included in the next two, although slightly grayed out.

Explanations of the individual panels:

- Panel 1: Randall's wife-to-be (at that point) receives a diagnosis over the phone (from Dr. Ponytail) as Randall sits by her side supportively. His wife has Megan long hair at this time.
- Panel 2: His wife undergoes IV (intravenous) chemotherapy. Because of the hair loss that results from chemotherapy, many patients opt to shave their heads when they undergo chemotherapy. As can be seen from the stubble she did not shave her hair, but has lost almost all of it. Only the hair coming back between chemo sessions is the cause of the stubble. Her hair grows back over the course of the panels following the end of her chemo (from panel 7).
- Panel 3: The two of them spend time alone together, experiencing something beautiful in the world for it may be one of her last chances to do so. Randall

reinforces this sentiment in panel 8. In this panel (#3) she wears a knit cap presumably because it is cold, as well as the fact that patients with hair loss from chemo are urged by doctors to keep their heads covered to protect their scalps from the sun.

- Panel 4: The couple waits for a phone call from her doctor to hear the results of a scan. Both are clearly impatient and anxious.

- Panel 5: More chemotherapy. The couple plays Scrabble, in which players use letter tiles to spell words in a cross-word style. She uses the fact that she has cancer as leverage to get Randall to ignore the fact that the word she has played (zarg) is not a real word. It should be noted that "zark" (with "k" instead of "g") is a fictional swear word from The Hitchhiker's Guide to the Galaxy.

- Panel 6: Someone suggests they come for a visit next year, but all they can think about are the words "next year." Their future is entirely uncertain because of her health, making long-term planning a consistent source of worry and doubt. In this panel she wears a knit cap to hide her missing hair.

- Panel 7: Randall and his fiancée marry. With the chemotherapy completed, her hair has grown back enough that she has stopped using her knit cap.

- Panel 8: The couple goes whale (humpback whales) watching, possibly on their honeymoon. In this panel, she again wears the knit cap likely because it is cold.

- Panel 9: Randall paraphrases a line from the song "Still

Alive" (watch the video) from the video game Portal ("I'm doing science and I'm still alive"). He does this because his wife is again back at her laptop working.

- Panel 10: The two of them sit under a tree reflecting on the significance of the past two years.
- Panel 11: Randall and his wife go out to dinner to celebrate the fact that she has made it two years since her biopsy. This turns awkward for Hairy, the waiter, since he had assumed it was an anniversary of their marriage.

The title text is referring to a possible side-effect of chemotherapy drugs, the inability to concentrate. It could also just be the fact that the chemo can make you feel just terrible. When whatever effect kicks in, she loses the rest of their Scrabble games for that day. However, as we see in panel 5, there is a reason why she wins all of the first half of their games. But this is not enough, or she even forgets to play on the cancer, when the drugs take effect.

The use of the asterisk in the title text for "*dominated*" might be a reference to the 1999 game Unreal Tournament in which the game announcer voice would from time to time use the words "dominating" or "dominated" in a deep tone when a player is doing really well in the game (for example being on a multi-kill strike). Example sound here.

#1142: Coverage

December 03, 2012
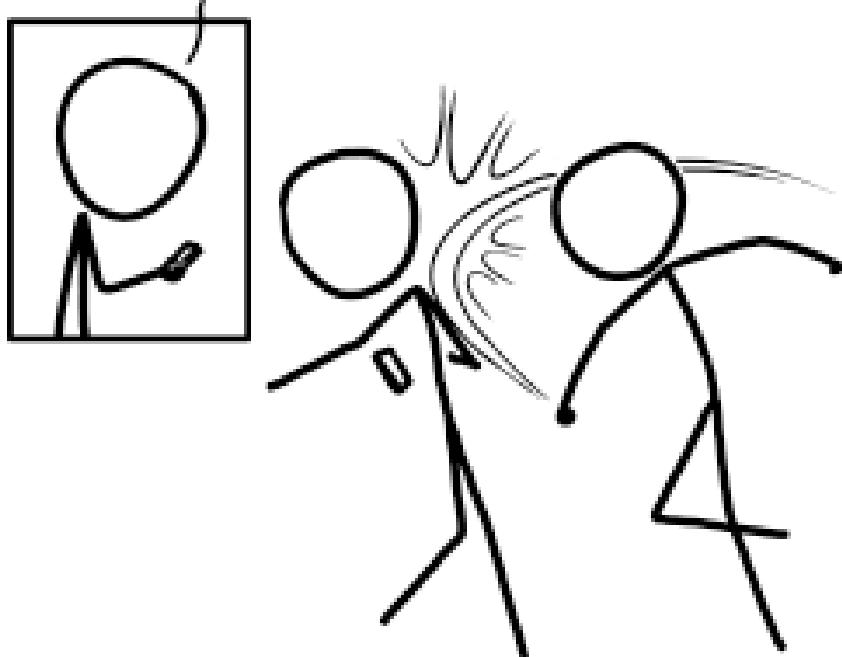
FARADAY CAGEMATCH

My resonant tunneling diode phone has limited range but a short enough wavelength to penetrate even the densest cages. This gives me a major combat advantage, hopefully.

Explanation

The caption "faraday cagematch" is a portmanteau of "faraday cage" and "cagematch".

A Faraday cage is a cage of conducting material that interferes and blocks out electromagnetic radiation like cell phone signals, provided the material is of the appropriate thickness and the gaps between the "bars" are significantly smaller than the wavelength of the radiation. A cage match is a type of professional wrestling match in which the participants fight in a ring enclosed by a metal cage. The comic caption is a play on the two terms, putting Cueball into a cage match in the Faraday cage that is blocking his reception.

Also the fact that Cueball gets hit in the face immediately after stating that the coverage is awful might be a joke about the different meanings of the word cover, in boxing for example the word cover-up is a defensive technique, while cell phone coverage refers to the connection quality of his phone to the mobile phone network. The fact that Cueball, obviously referring to his phone signal, complains about awful coverage (caused by the faraday cage) while his head is also badly or not at all covered (caused by himself), which allows his opponent to strike him, might be described as ironically comedic.

The title text is a play on a rule in cage matches that states that a participant wins if they are first to escape the cage. Tunneling diodes are capable of fast operation, allowing

a device to generate high frequency signals, which are more capable of penetrating the mesh openings in a Faraday cage.

Randall uses Faraday cages again in 2338: Faraday Tour.

#1143: Location

December 05, 2012
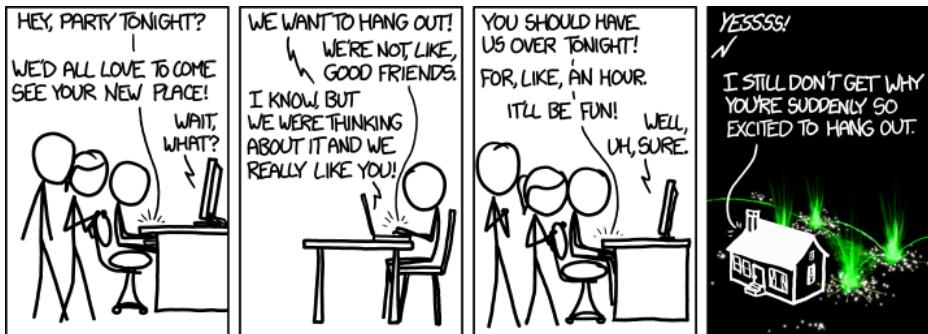
Ingress: Foursquare With Space Noises.

Explanation

Ingress is an augmented reality location-based service game in which players have to visit certain real-world places marked by the game as containing in-game objectives called portals (much like in its far more well-known offspring Pokemon GO). The single guy in the comic owns a home surrounded by an abundance of portals, which makes it an attractive destination for the three friends who contact him via the computer. They are obviously not really friends of the guy, but just wish to come by because of the portals.

The portals in the comic are controlled by the green "Enlightened" team (and have links and a field), making them resource sources for the "Enlightened" team, and targets for the blue "Resistance" team.

Foursquare, referenced in the title text, is another service that lets users check into places they visit for discounts in a similar way to how Ingress players visit portals for points. Unlike Foursquare places, which are businesses and public places such as parks, Ingress portals also include historic houses that are still private residences, as well as churches, so Ingress is more likely to reward people visiting a friend's house. "Space noises" refers to the ambient sounds when playing Ingress.

#1144: Tags

December 07, 2012

<DIV> Q: HOW DO YOU ANNOY A WEB DEVELOPER?</SPAN>

\<A\>: Like \</a\>this.

Explanation

First of all, this comic clearly annoyed enough web developers to get them to write this long explanation about this comic.

HTML is a markup language used in the development of websites, and is the subject of this comic. Most distinct elements of a webpage – like this paragraph of text, the title of this section, or the logo in the top-left of this page – are enclosed in HTML tags which describe the type of object they are. The comic employs multiple poor HTML practices while asking the rhetorical question of how best to annoy web developers, effectively answering the question that it poses.

In HTML, all elements (except self-closing elements like <img>) should consist of an open and close tag of the same type <div>Like this</div>.

HTML (except in its formulation as an XML language—XHTML) has never been case-sensitive, but the practice of using uppercase tags for readability is long outmoded, and the mixing of cases in this example would definitely annoy a developer.

Another basic idea of HTML is that all elements should be properly nested. That is, any element whose open tag occurs inside a div must be closed before the div is closed.

NB: In practice, web browsers will error-correct nearly all these problems. In this case, browsers will ignore the

meaningless and interpret both the question and some of the html after this section as being inside a div.

The rules of proper nesting also put restrictions on which tags can be placed where — "block" elements, such as <div> cannot be placed inside "inline" elements, such as <span>, and inline elements must be placed inside a block element of some kind. Thus, <span><div> is forbidden, even if the tags are closed in the proper order.

Further, web developers make a distinction between semantic and structural elements. Semantic elements contain a clue in their name as to what kind of an element they are — for example, an <article> tag contains an article, such as a blog post or news article, while an <ol> tag contains an ordered list. (It's wise to note that this is not an absolute rule; it's possible to put non-article content in an <article>, it's just not recommended.) Semantic tags do not, however, indicate how their contents are to be displayed; your browser might display an <article> in the default font, layout, and placement, while mine, a screen reader, might ignore everything on the page except <article>s.

Structural tags, on the other hand, give no clues as to what they contain; they just indicate how a web page is to be laid out. <span> and <div> are structural tags; they can contain anything. Their definitions in HTML simply indicate that <div> is a block tag (it can affect both what the text looks like and where it is on the page; by default, it is displayed in a separate block from the rest

of the text in the page, and has at least one line break before and after its display) and <span> is an inline tag: it affects what its text looks like, but not where it is on the page. Without additional attributes, it's impossible for a browser to tell what's supposed to be inside a <div> or a <span>, which means that my screen reader can't just pluck out the blog posts and read those.

The title text makes reference to , which is the HTML escape code for non-breaking space which is a type of space that will keep two words together, and will not allow word wrapping to separate them. If the words come at the end of a displayed line, how this is handled depends on the browser and on the element's styling; some browsers and styles will force the connected words onto a new line, while others will "overflow" the edge of the container to accommodate the linked words. This is useful, for example, for keeping units with a number so it is easy to spot 100 km instead of needing to hunt for 100km. Using a non-breaking space at the end of a line, without another word on its trailing end, is only useful in extremely rare and limited circumstances, and does not generally have a purpose.

The title text also uses an <A> tag, seemingly to indicate an answer. In fact, <A> is an anchor tag, which creates hyperlinks. It is not an answer tag. This tag is generally used with either the href= (which creates a link to another URL) or name= (which creates a named anchor on the page that can be linked to with href=#) attribute (but not generally both at once). In addition, the placement of <A> and (the capitalization here is

also irritating to a web developer who values consistency) indicates that ": Like " should be a link or named anchor, but "this." should not. Whether or not to include punctuation in an anchor is a matter of some debate among developers, but including excessive whitespace is generally frowned upon, and the anchor should include all of the relevant text. It's also recommend that the text of links shouldn't be overly general, avoiding "click here", and little can be more general than a link saying "this".

#1145: Sky Color

December 10, 2012

MOMMY, WHY IS THE SKY BLUE?

RAYLEIGH SCATTERING! SHORT WAVELENGTHS GET SCATTERED *WAY* MORE (PROPORTIONAL TO $\frac{1}{\lambda^4}$). BLUE LIGHT DOMINATES BECAUSE IT'S SO SHORT.

OH.

SO WHY *ISN'T* THE SKY VIOLET?

WELL, BECAUSE, UH...

...HMM.

MY HOBBY: TEACHING TRICKY QUESTIONS TO THE CHILDREN OF MY SCIENTIST FRIENDS.

Feynman recounted another good one upperclassmen would use on freshmen physics students: When you look at words in a mirror, how come they're reversed left to right but not top to bottom? What's special about the

horizontal axis?

Explanation

The point of this comic is that often, curious children, like Jill, ask their parents simple questions about understanding how the world works. Often, although the question is simple, the answer is not. "Why is the sky blue?" is a common example, since most parents are not familiar with Rayleigh scattering, and thus are unable to answer the question.

Randall's hobby is to make those questions even harder, so that the parents who are familiar with the subject (scientists, for example) will be stumped.

Another point of this comic is that we often think that we understand a scientific phenomenon (e.g., "Why is the sky blue?"). However, a certain simple follow-up question (e.g., "Why isn't the sky violet?") can often uncover large gaps in our actual understanding.

Rayleigh scattering is the phenomenon that explains the color of the sky, where light of every wavelength gets scattered in the air by the inverse quartic (fourth power) of its wavelength as given in the comic. In the visible spectrum, blue light has a wavelength of 450–495 nm while violet has a shorter wavelength of 380–450 nm. Violet light does indeed get scattered more than blue light, however the lower portion of the spectrum for sunlight consists of blue light and eyes are much more sensitive to blue light than violet light. Furthermore, the sunlight contains more blue than violet to begin with as a

result of the surface temperature of the sun. This leaves the impression of a blue sky. A good explanation, including why blue and not violet, can be found in Usenet Physics FAQ :: Why is the sky blue?, but note that human color perception is more complicated than described there. xkcd later tackles the same question in 1818: Rayleigh Scattering.

The title text refers to a mirror image and is discussed by the famous American theoretical physicist Richard Feynman in a famous BBC documentary , as one of the problems which he used to have fun with freshmen (in a British English context, that would be a student in their initial year of university, more commonly referred to as a "fresher", but the term may elsewhere be applied to those in the first year of other stages of education). If not for this direct quote, the apparent age of the potential student pictured, and the scientific detail of the question, could easily apply to lessons in the later years of primary education.

A mirror image is a virtual image produced by the reflection of light on a mirror. It's common to think of images in mirrors as being reversed left-to-right, as any text held in front of us will appear flipped. This is actually an issue of perception. In a plane mirror, images are reflected directly: the left side of your body will be reflected in the left side of the mirror, and vice-versa. The source of confusion is that people tend to think of a mirror image the way we would think of a person facing us. When another person faces us, they turn around the vertical axis, placing their right hand on our left side, so

seeing our left hand on our left side in a reflection seems like an inversion, even though it's a direct representation. By the same token, in order to hold text up to a mirror, we generally flip it around the vertical axis, so that the start of the text is on right, and the end on the left (in English, at least). When the mirror reflects this, we see the text as backward, but the mirror hasn't reversed it, we reverse it when we turn it toward a mirror.

In other words, the vertical axis is only "special" because we're used to objects turning around it, so we come to expect that reversal, instead of a reflection.

You can induce a mirror to reverse left and right only --- by standing next to it instead of in front of it, facing along the plane of the mirror itself. If you lift your right arm, you can clearly see your image's left arm raising, without having to adjust for frame of reference. Similarly, you can induce a mirror to reverse top and bottom only by holding it flat above your head or laying it flat on the ground and standing on it (or perhaps standing under a suitably equipped bedroom ceiling). See this video for a demonstration.

#1146: Honest

December 12, 2012
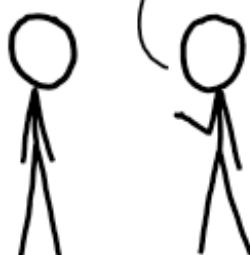
I didn't understand what you meant. I still don't. But I'll figure it out soon!

Explanation

The phrase "let's be honest here—" is often used to soften a statement that might otherwise seem crass. Before Cueball can finish his sentence, he is interrupted by his friend, who takes the opportunity to honestly state his deepest feelings.

The human condition is essentially terrifying. Try to keep up appearances.

It is possible that Cueball's friend's last response, "Sorry," (which is on response to Cueball saying, "Too honest. Scale it back.") is insincere as a way of scaling his honesty back by not being honest in his next statement.

The title text could be a reference to angst, a word used in English to describe an intense feeling of panic — but the friend of Cueball proposes to work on a better understanding on his own fears.

Randall has mentioned having ADD, such as in 1106: ADD. People with neurological or psychological problems such as ADD often express having trouble with things in everyday life that other people seem to find easy.

#1147: Evolving

December 14, 2012
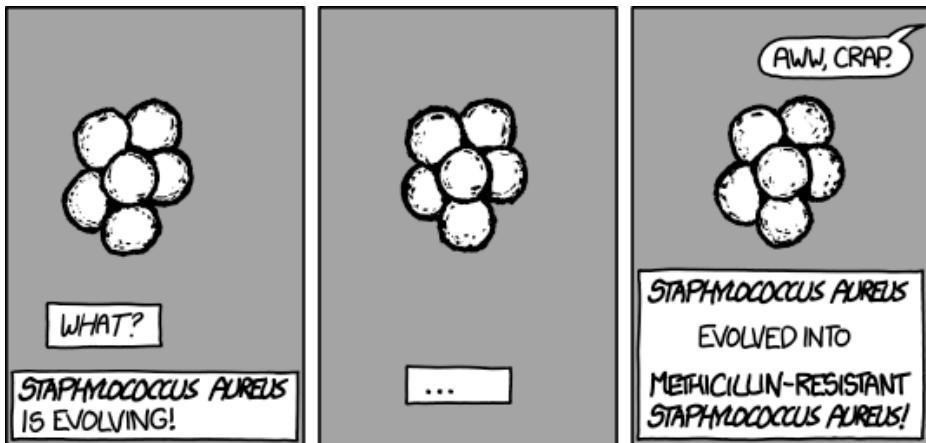
Biologists play reverse Pokémon, trying to avoid putting any one team member on the front lines long enough for the experience to cause evolution.

Explanation

In a Pokémon game, a player goes out in search for the eponymous creatures. Many Pokémon can be found directly in the wild, but there are also a lot of Pokémon that require training and growth, to cause them to "evolve" into new Pokémon. "Evolve," the game's term, is a misnomer which earned itself quite some controversy in the past; in reality, Pokémon "evolution" is more akin to puberty or metamorphosis, since instead of the entire species of Pokémon acquiring changes through an extended period of time, one specific member of the species grows instantly to the "higher stage." At that point in the game, the Pokémon glows before transforming into the new form, then stops glowing, and the very same text "What? XXX is evolving!" is used (see this video or those screenshots for instance). The changes of such a transformation can be quite dramatic ... or not.

This comic depicts the "evolution" of bacteria as observed by a Biologist in the same format as the game Pokémon. Here we have Staphylococcus aureus, which is not a desirable bacterium (it causes Staph infections) which evolves into "Methicillin-resistant Staphylococcus aureus". Methicillin is an antibiotic. If the bacterium becomes resistant, it means the antibiotic will be less effective against it, making infections harder to treat. Thus the observer is not pleased with such an evolution.

The title text references this by suggesting that biologists do not want bacteria to evolve in this way, as opposed to

Pokémon where you put a Pokémon on the "front lines" as much as possible to gain it experience and hope it evolves. A point of irony is that Pokémon evolution can easily be prevented, by using an Everstone, or stopped, by pressing the B button in the game controller during evolution, especially if there are Pokémon that one does not want to evolve. The bit about the front lines is that, if a bacteria colony is exposed sufficiently to an antibiotic, those bacteria with any level of resistance to the antibiotic are less likely to be killed by the antibiotic, and are able to reproduce in spite of the antibiotic. Most future generations of bacteria now have this level of resistance instead of just a small subset. This makes the likelihood of future more resistant and harder to treat mutations even more likely.

Staphylococcus aureus is a very common bacterium, that under an electron microscope looks like the xkcd drawing, and is the major cause of staph infections in the nostrils and skin. Hospitals are often plagued with outbreaks of Methicillin-resistant Staphylococcus aureus (MRSA), which is very difficult to treat as the typical antibiotics do not work on it.

#1148: Nothing to Offer

December 17, 2012
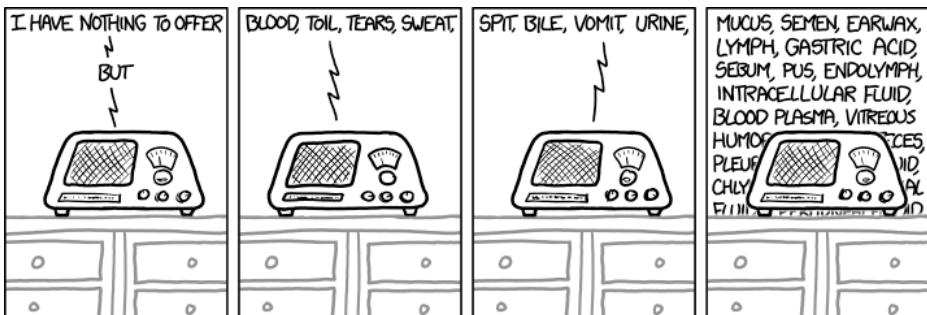
cerebrospinal fluid, pericardial fluid, sputum, aqueous humor, perilymph, chyme, hydatid fluid, interstitial fluid, rheum, and gin.

Explanation

"I have nothing to offer but blood, toil, tears, and sweat" is a famous phrase in a speech given by Winston Churchill, which would be heard on the radio in the 1940s. The comic then goes on to list numerous other increasingly obscure bodily fluids, including through the title text, ending humorously with gin (which Churchill was partial to).

The fluids in order: blood, tears, sweat, spit, bile, vomit, urine, mucus, semen, earwax, lymph, gastric acid, sebum, pus, endolymph, intracellular fluid, blood plasma, vitreous humor, feces, pleural cavity fluid, chyle, synovial fluid, peritoneal fluid, cerebrospinal fluid, pericardial fluid, sputum, aqueous humor, perilymph, chyme, hydatid fluid, interstitial fluid, rheum, and gin. The partially obscured ones near the end are taken by process of elimination. CHLY- seems to be a typo for CHYL(E).

#1149: Broomstick

December 19, 2012

'Broom first, then slippers.' 'How do I know you'll return the broom once you've secured your ticket?' 'I'll leave my little dog as collateral.' 'Great. Pleasure doing business!'

Explanation

Megan plays the part of Dorothy, the protagonist of The Wonderful Wizard of Oz. Dorothy has been trapped in the Land of Oz due to extreme weather and must obtain transportation home. An off-screen character, presumably the Wizard of Oz himself, offers her a ride if she obtains the The Wicked Witch of the West's magic broom. Megan wears Ruby Slippers and uses them as a bargaining chip to obtain the Witch's broom.

The "little dog" offered in the title text is Dorothy's faithful companion Toto.

The Wicked Witch of the West is a fictional character and the most significant antagonist in The Wizard of Oz, which is based on L. Frank Baum's children's book The Wonderful Wizard of Oz. In the 1939 version of The Wizard of Oz, the Wicked Witch flies on her broom over the Emerald City demanding Dorothy's surrender, and the Wizard demands the destruction of the Witch with her broom as proof, in exchange for granting the wishes of Dorothy and her companions.

The point of the comic is to show how easily Dorothy could resolve the situation if she was willing to forsake both her traveling companions and her pet. She leaves Toto with the Witch; it is unclear whether she plans to retain possession of the broom and return it in order to collect him, or plans to abandon Toto as well. She will also leave Oz completely at the mercy of said witch by

giving her the Ruby Slippers and leaving with the Wizard.

It should be noted that this resolution defies the canon established in the movie, as nobody could remove the slippers as long as Dorothy lived, presumably including Dorothy herself. Additionally, it turns out that the Wizard was a fraud and was unable to take her home, and ironically it is the ruby slippers that did so.

The Wizard of Oz was also referenced in Five-Minute Comics: Part 4, and 1427: iOS Keyboard.

#1150: Instagram

December 21, 2012

I'm gonna call the cops and get Chad arrested for theft, then move all my stuff to the house across the street. Hopefully the owners there are more responsible.

Explanation

As indicated by the title, this comic is an allegory for a controversy over Instagram, a photo-sharing social network now owned by Facebook. In December 2012, Instagram changed their terms of use, allowing the network to sell user-uploaded images, without profit to the content generators. This infuriated many users, who closed their accounts or stopped uploading images.

In the comic Cueball tells his Cueball-like friend about his problem with Chad, who just sent him a note telling him that he no longer wants to store all this stuff that Cueball has left in his garage. Cueball left it there because Chad has nice shelves and lets him in to see his stuff whenever he wishes, so that was really convenient.

Chad's note tells Cueball that he has a month to move his shit — after that he will try to get rid of it by selling it on Craigslist.

Cueball is outraged, as this is not way to run a storage business. But when his friend asks him if he paid anything for this "storage business", it turns out that he did not. The friend then concludes that it is not a storage business.

This is exactly the problem with Instagram (or its users). A user does not pay anything, but to create an account you have to sign a terms of service/end user license agreement. A user has thus effectively signed their

consent to whatever Instagram has written. Instagram can then change these terms if they give a forewarning (as Chad has done here). However, most users don't read the terms before clicking the "I agree" option, so it can come as a shock when Instagram uses the data in a way the user hadn't anticipated.

Instead of getting angry Cueball should thus just go and remove his stuff, but instead he is just going to almost (but not quite) stop giving Chad any more stuff.

This is also making fun of those Instagram users that complain about the new way of using their data, but at the same time keep uploading more pictures. The users have often developed a kind of addiction, so they cannot just stop sharing their life (in pictures).

In the title text Cueball continues with an idea of calling the cops. He thinks that Chad is a thief. He thus ignores that he left the stuff at Chad's house of his own accord. And after Chad has been arrested (which will of course never happen) he wishes to move all his stuff to another house, just to continue to get free storage.

There are two major flaws in this logic - and it is the same with the logic of the disgruntled Instagram users. You cannot accuse Instagram of stealing because it was you who gave them the images in the first place, and it is irresponsible to assume that this will not happen if you give your photos to another free social networking service (e.g. Facebook).

These kind of issues (with Facebook as the evildoer) are also the subject of 743: Infrastructures and 1390: Research Ethics.

#1151: Tests

December 24, 2012
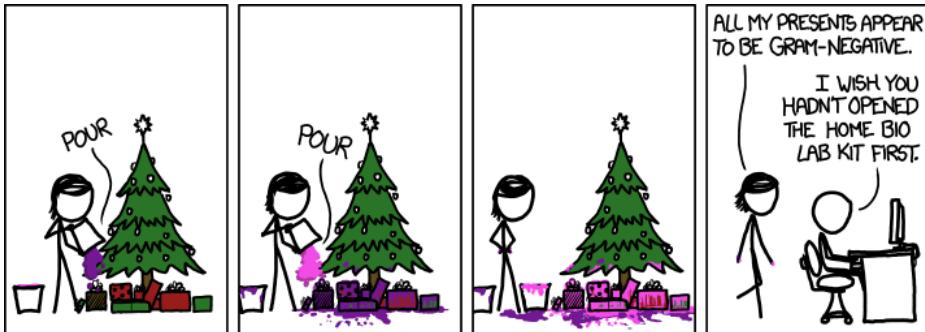
In fact, one of the boxes is full of Staphylococcus. The wrapping paper is coated in E. coli, though, so it's an understandable mistake. You know, we should really stop accepting gifts from that guy.

Explanation

The first present Megan opened contained a home biology lab kit, including the equipment needed to perform a Gram stain. Gram staining is a technique used in microbiology to separate bacteria into two broad categories based on the structure of their cell walls. The sample is treated with two different dyes: first a purple dye, then secondly a pink one. When subsequently examined under a microscope, "Gram-positive" bacteria retain the purple color of the first dye, whereas "Gram-negative" bacteria do not, allowing the second pink stain to show. All Megan's presents have been stained pink, and are presumably therefore Gram-negative.

In the process, she has damaged the other presents, hence Cueball's wish that she had opened another present first (although given that she only visibly dumped the dye onto the wrapping, the presents could still be fine).

The title text refers to two bacteria commonly used as controls to confirm that the technique has been correctly performed: Staphylococcus aureus (Gram-positive) and Escherichia coli (Gram-negative). Neither are bacteria you want to be coming into contact with in any substantial quantities,[citation needed] hence the need to stop accepting presents from "That Guy".

#1152: Communion

December 26, 2012

The local police, growing increasingly concerned about this church, ask parishioners to take a sip of wine and then spit it back out for DNA testing. It's blood, and it matches a 1970s murder victim.

Explanation

This comic plays on the Christian doctrine that the Holy Communion bread and wine are Jesus' flesh and blood. It is based on the words of Jesus from the synoptic gospels and Paul's first epistle to the Corinthians during the Last Supper, today used by the priest as Words of Institution. According to the Roman Catholic doctrine of transubstantiation, as well as in the Eastern Christian tradition, the substance (using the Aristotelian concept that all things have an accident, or physical make-up, as well as a substance, or true nature/purpose) of the bread and wine change to Jesus' flesh and blood, while their accidents remains the same. Many people, including many Catholics, believe this concept means the bread and wine literally turn (i.e., their substance changes) into Jesus' flesh and blood during the ceremony. Some Protestant denominations reject this doctrine, both its actual and misunderstood application, with some taking the words as wholly symbolic of Jesus' sacrificial death and others believing the bread and wine create a real spiritual connection to Christ but do not change their substance.

In the second panel, Danish accurately describes what would happen at a traditional Christian Christmas service, though in such a way as to make it sound macabre.

After walking and thinking in panel three, she makes it more macabre when worrying that they, again, may have

gotten hold of the wrong child for the sacrifice needed to drink blood and eat flesh.

The title text further spoofs the common understanding of the doctrine of transubstantiation and elaborates on Danish's concern in the last panel by supposing that the act of taking a sip of wine during Holy Communion turns that wine into the blood, not of Jesus, but of a decades-old murder victim. Alternatively, the title text could be interpreted as saying that the wine actually acquires Jesus' DNA, and that Jesus was "killed" in the 1970s. The police, who investigated Jesus' 1970s death, would then have his DNA on file.

It should be noted that saliva includes DNA, so the positive result may be the DNA from the person who spit the wine/blood out and does not necessarily mean that that person was murdered by the church in order to prepare the wine/blood. This could be a reference to the resurrection of Jesus.

#1153: Proof

December 28, 2012
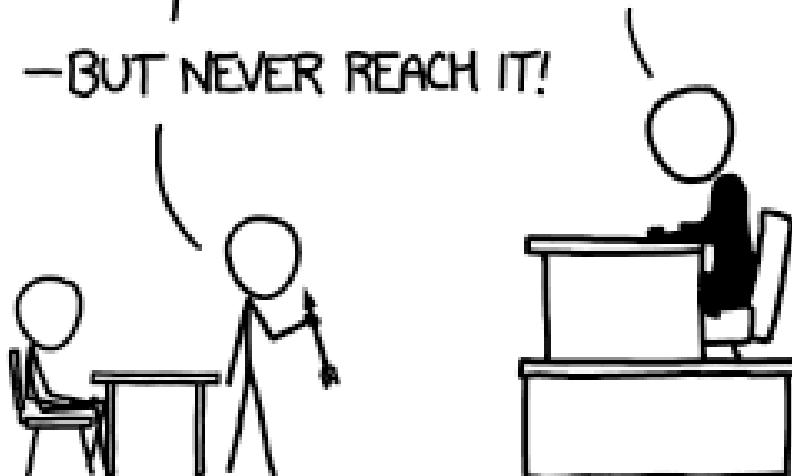
The prosecution calls Gottfried Leibniz.

Explanation

Zeno of Elea was an ancient Greek philosopher who devised several apparent paradoxes of motion called Zeno's paradoxes. Here are the two relevant to the comic:

There are two possible law vs math/logic puns in the comic, on the words "approach" and "proof." "Approach the bench" is a legal term meaning to have a private conversation with the judge; approach in calculus means an infinite process where a function value gets closer and closer to a limit value that it never actually reaches, reminiscent of Zeno's paradoxes. "Proof" is also ambiguous, with a different meaning in formal mathematics than in jurisprudence. See Proof (truth) and Mathematical Proof, for example.

Gottfried Leibniz is the co-inventor of calculus (along with Isaac Newton; see 626: Newton and Leibniz). If Leibniz were to testify in this imaginary trial, he might argue that calculus invalidates Zeno's paradoxes, because the moving arrow has a different velocity than a stationary one (the function describing the motion has a nonzero derivative at the point), and the infinite series in the dichotomy paradox has a finite sum. Both Zeno and calculus assume a continuous, infinitely divisible, ideal spacetime (as does quantum mechanics); a different solution would be available if spacetime turns out to be discrete. However, Zeno is arguably not concerned with actually calculating the correct answer. In the real world, Zeno can be trivially disproven simply by moving and

reaching a desired target (it is said that Diogenes the Cynic reacted to the paradox by wordlessly walking from one side of a room to the other, to demonstrate his contempt for it). It remains a question of debate whether a mathematical approach addresses the central points in Zeno's arguments.

994: Advent Calendar is also about Zeno.

#1154: Resolution

December 31, 2012

If at first you don't succeed, that's one data point.

Explanation

Cueball wants to break a very common habit of resolving to do something (go on a diet, for example), not doing it, and then trying the same, dysfunctional plan again, thinking it will work "this year." This is another way of stating a common folk definition of insanity: to keep doing what you always do yet expecting different results. The irony is that Cueball resolved the same thing last year, and it is implied it didn't work, but he says it'll be different "this year." The title text is a parody of the saying "if at first you don't succeed: try, try, try again.". There have been many other New Year comic. See 1027: Pickup Artist for a comic describing a similar psychological problem.

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